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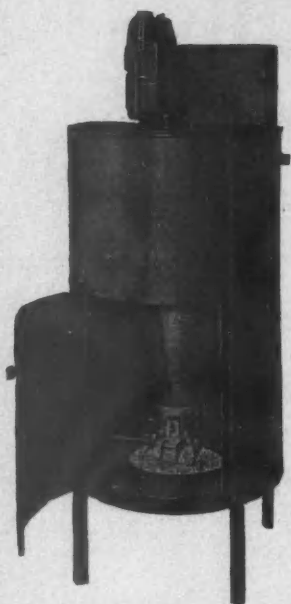
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## Some Findings in the Epidemic of Poliomyelitis in Alberta, 1927

R. B. JENKINS, M.D.

*Provincial Inspector of Health, Alberta*

**D**URING the year 1927 an epidemic of poliomyelitis occurred in Alberta. Considerable information was gathered which it is believed will be of interest to the profession. For some years prior to 1927 there had been sporadic cases in one part of the Edmonton district. In order to get fairly complete information of the situation a questionnaire was prepared, asking, among other things, for the following data concerning the patient: name, age, sex, date and nature of first symptoms, date of onset of paralysis, source of water supply, source of milk supply, presence of other illness in the family, nature of such illness, the number of cases of poliomyelitis in the family, whether there were cases amongst school-mates or friends, whether or not the patient had been away from home during the previous month, names and addresses of recent visitors at patient's home, names of employees in household. This questionnaire was used in collecting data when, in the 1927 epidemic, some two hundred copies were returned.

In all there were 354 cases reported during the year, 101 of these occurring in Edmonton and the greater part of the remainder in the district surrounding Edmonton, a district with a radius of about 100 miles, which is, in most part, tributary to that city. Fifty-three deaths occurred.

### DISTRIBUTION OF CASES ACCORDING TO SEASON

As will be seen from table I, on seasonal incidence, an apparently isolated case developed in May. No others were reported until July, but from that time until the end of the year cases were reported, with the peak of the incidence in September and a rapid falling off with the onset of the colder weather. It is fairly apparent that the abatement of the epidemic was not entirely the result of a lack of susceptibles, for when the warm weather of the following year arrived, there was a recrudescence of the disease in a part of the province to the north and east of Calgary which had escaped the first outbreak.

Table 2 includes certain information as to sex distribution, 51.5 per cent being males and 48.5 per cent females, a more even distribution than is usually expected.

From the same table it will be seen that there was an unusually high incidence in the older age groups, there being 51.6 per cent in the age group 5-14, 22.3 per cent in the 15-24 group, and 5.9 per cent in the 25-44 group, while there were only 19.7 per cent in the age group under five years.

TABLE I  
POLIOMYELITIS—ALBERTA, 1927  
*Seasonal and Geographic Distribution*

	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Calgary .....						10	3			13
Edmonton .....		1		2	51	41	5		1	101
Medicine Hat .....							3			3
Red Deer .....						2		2		4
Wetaskiwin .....						2				2
Towns and villages .....					11	39	9	5	1	65
Rural districts .....					5	103	49	8	1	166
Total .....		1		2	67	197	69	15	3	354

TABLE II  
POLIOMYELITIS—ALBERTA, 1927  
*Distribution According to Age and Sex*

	Sex		0-1	1-4	5-14	15-24	25-44	45-59	Total
	M.	F.							
Calgary .....	6	7	1	4	6	2			13
Edmonton .....	53	45	1	3	33	47	15	2	101
Medicine Hat .....	1	2		2	1				3
Red Deer .....	4			2	1	1			4
Wetaskiwin .....	2			1	1				2
Towns and villages .....	27	38	3	12	41	9			65
Rural districts .....	89	77	5	36	100	19	6		166
Total .....	182	172	10	60	183	79	21	2	354
Per cent of total in age group .....			2.8	16.9	51.6	22.3	5.9	.5	100

No attempt has been made to determine the comparative morbidity rates of the urban and rural districts since it would be practically impossible to reckon with any degree of accuracy the rural population. The census for rural districts, excluding towns and villages, is given for municipal districts, which cover an area in most instances of 324 square miles. Although these districts are, for administrative purposes, looked upon as units, they cannot be considered as units from a social standpoint, for in many the population is tributary to some trading point outside of the district, there being little intercourse between the different parts of the same district. Since there are about 25 municipal districts which were in part affected by the epidemic, on the outskirts of the more heavily infected part, it would mean that no reasonably accurate idea could be obtained as to the exposed population.

## MULTIPLE CASES IN FAMILIES

In the group from which special information was received, there were 189 families involved. In 14 of these families there were two or more diagnosed cases of poliomyelitis. There were 33 other families where frank cases of poliomyelitis were associated with persons (65 in number) suffering from an illness, the symptoms of which were similar to the initial symptoms of the patients in whom paralysis developed. If one may be permitted to consider these cases as non-paralytic poliomyelitis, which appears to be justifiable in view of the circumstances, we have 47 families out of 189 with two or more cases. During a survey made in the latter part of the epidemic, an opportunity was given to make further enquiries in this connection. Unfortunately, as this aspect was entirely a side issue, no data were kept; but I am convinced that the non-paralytic cases were much more numerous than would appear from the reports submitted by busy physicians who, when or if they enquired, had to obtain information from parents too distracted by the presence of a serious affliction to recall at the time the occurrence of apparently minor ailments in the other children.

## THE CLINICAL FINDINGS

*The Pre-paralytic Stage*

Information concerning the onset of 191 diagnosed cases was received. Of these only 11 showed paralysis as the first symptom. In the remaining 180 the paralysis was preceded by a definite initial stage; the shortest was 12 hours; the longest was 14 days, and the average was 4.37 days. In only 1 per cent of the cases was this stage reported as having a sudden onset.

There was general malaise in 17.2 per cent, headache in 47.2 per cent. Fever was reported in 80 per cent of the cases; in some the temperature rose to 104-105 deg. F., but in the majority of the cases it did not exceed 102 deg. F.

Symptoms of inflammation of the respiratory passages were evident in 28 per cent, sore throat being the most common, occurring as it did in 19.5 per cent. Coryza appeared in 7.8 per cent, and bronchitis in 3.99 per cent.

Gastro-intestinal symptoms were more frequent, being present in 44.4 per cent of the cases; nausea and vomiting in 36 per cent; anorexia in 7.2 per cent, and diarrhoea and vomiting each in 2.8 per cent.

17.8 per cent showed altered temperament or mental condition in drowsiness, restlessness or irritability. Two patients suffered from delirium in this stage.

Pain in various parts of the body was a frequent and early symptom, appearing in 50.6 per cent of the cases.

In one case a rash was reported as being present in the initial stage but the nature of the rash was not described.

*Paralyses*

No accurate statistics are at hand regarding the degree of paralysis which developed in the affected parts, but the information in Table III has been gathered:

TABLE III  
POLIOMYELITIS IN ALBERTA, 1927

<i>Location of Paralysis</i>		
Paralysis of both legs was reported in .....	19 cases or	24.3%
Paralysis of one leg only, reported in .....	22 " "	28.2%
Paralysis of one leg and one arm, same side, reported in .....	12 " "	15.4%
Paralysis of one leg and one arm, opposite sides, reported in .....	3 " "	3.8%
Paralysis of both arms, reported in .....	2 " "	2.5%
Paralysis of both legs and one arm, reported in .....	6 " "	7.7%
Paralysis of both legs and both arms, reported in .....	6 " "	7.7%
Paralysis of both arms, reported in .....	4 " "	5.2%
Paralysis of one arm, reported in .....	4 " "	5.2%

*Treatment of the active condition* was unsatisfactory. The use of convalescent serum was considered but as there was scant information at the time, regarding its use, there was no development in this respect. Even if adequate information had been available, it is doubtful if much of value would have been obtained, for the public, in spite of the Department's educational efforts, did not realize the significance of the early symptoms and in the majority of the cases the physicians were called only when there was definite paralysis. Rosenow's serum was tried in a number of cases but unfortunately only a small supply could be obtained and no information of value resulted from its use.

#### CONTROL MEASURES

*Patients were isolated* for twenty-one days from the onset of the disease and *contacts were quarantined* for ten days from the last exposure, except where adult members were supporting the family in occupations which did not entail the handling of food or bring them into contact with children.

It was required that *concurrent disinfection* be carried out, which disinfection included the proper disposal of nasal and throat excretions and the excretions from the kidneys and bowels. Instructions were given regarding the care of patients' dishes, etc., and regarding the need of aseptic nursing.

An *educational campaign* was undertaken by the Department and through the press the widest possible publicity was given to information concerning the prevalence of the disease, the means of its transmission, the importance of the carrier and of the non-paralytic cases as factors in the spread of the disease, the need of supervising closely the activity of children and general advice on hygienic measures. A special bulletin on poliomyelitis was issued and distributed to newspapers, also to local boards of health, school boards and to other organizations directly or indirectly concerned with public health. Later a summary of the most recent literature on the disease was prepared and sent to all physicians in the Province. Bulletins were also issued dealing with the after-treatment of the disease.

#### *Schools and Public Meetings*

With the appearance of the disease in any community the local board of health issued instructions that all public gatherings were prohibited

for a definite period; in most instances this was set at two weeks. The schools were closed in practically every district that was affected. There is no doubt that this measure was beneficial in the rural districts where the closing of the schools afforded anxious parents the opportunity to voluntarily "quarantine" their children, an easy matter where the nearest neighbour lived from one hundred yards to half a mile away. In the cities, towns and villages where the authorities closed the schools without restricting the movement of children, they would have defeated their object of reducing contact if it had not been that concerned parents kept their children on their own premises.

The Provincial Board of Health, in advising on this question, recommended that rural schools of an affected district should be closed and that parents should be warned to keep their children at home. The local authorities of villages and towns were advised that their schools should be closed and the movements of the children restricted, but where circumstances prevented the enforcement of any such orders, the schools should be kept open and thorough, daily inspections of the children should be made.

In one town with a population of twelve hundred, in which the disease had appeared, the local board of health issued orders that no child be allowed on the streets without a permit from the board. Although there were cases in the surrounding district and the disease had made its appearance during the height of the epidemic only two cases developed in the town.

A number of officials were opposed to the closing of schools where adequate medical inspection was provided, chiefly on the ground that information gained through the inspection service would be helpful in controlling the epidemic. The opinion of the writer, however, is that, in an epidemic of poliomyelitis such as this, the contact of children should be reduced to the minimum, until we have some means of readily diagnosing the disease in its invasion stage and in the non-paralytic cases which will, despite the most efficient inspection, escape notice sufficiently frequently to be a serious menace to the community. Until we have this means of diagnosis and can assure the public of the efficiency of such means, children of careful parents will be penalized by the loss of instruction which will be given to children of parents whose ignorance or indifference permit them to "take a chance."

#### *Limitation of Travel*

On September 14th, the Provincial Board of Health issued an order which in part is as follows: "—does hereby require local boards of health in all municipalities in the Province in which infantile paralysis has developed to order that children under eighteen years of age be not permitted to change their place of residence to points outside the municipality in which they reside, unless a permit granting such permission has been issued by the local board of health of the municipality in which such children reside. It is further ordered by the Provincial Board of Health that, where points to which applicants for permits

desire to go are located within the Province, consent must be obtained from the local board of health of the district to which the applicant proposes to go, by wire, if possible, and at the expense of the applicant, and that when such applicants apply for permits to go outside the Province, the local authority of the point to which they desire to go must be notified that such applicants have been granted permission, not having, to the knowledge of the local board, suffered from nor been exposed to infantile paralysis."

Printed copies of the Provincial Board's order were forwarded to the secretaries of all local boards of health and to all medical officers of health. Notices of the order were sent to each postmaster in the Province with the request that the notice be prominently displayed.

The control of rail and bus traffic was enforced through the co-operation of the respective companies, who instructed their agents in the affected districts not to sell transportation for children without permits. The Provincial Board immediately advised the transportation companies of changes in the situation. Road traffic was efficiently controlled by the Alberta Provincial Police.

This order requiring the restriction of movement of children remained in effect until October 31st, 1927.

#### PROVISION FOR AFTER-CARE OF PARALYSED CASES

Realizing the need of some special measure to provide adequate after-treatment for the affected children, many of whom belonged to families who could ill-afford prolonged medical care, the Provincial Government considered establishing a special hospital for this purpose. To obtain some idea as to the possible number requiring treatment, a survey was undertaken. It was found that of the 131 patients seen, 67 would require considerable after-treatment. If the same proportion held, provision would have to be made for the treatment of about 150 children. As it was likely that only a limited number would require continuous hospitalization for long periods, it was decided to erect in Edmonton a 60-bed hospital. The first patients were admitted on January 31st, 1928.

The staff consists of a medical superintendent (an orthopaedic surgeon), superintendent of nurses, her assistant and head masseuse, a number of graduate nurses, and a secretary. A school teacher is also engaged in order that the children's education may be carried on concurrently with the treatment. Provision is made for an out-patient department to treat patients living in or near Edmonton and who can be cared for at home. A nominal fee is to be charged for this latter service and \$1.75 per day for in-patients.

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# Résumé of the Report on the Poliomyelitis Epidemic in Manitoba, 1928

**T**HIS report was prepared by the Medical Research Committee of the University of Manitoba, with appendices on the Method of Control Employed by Dr. A. J. Douglas, Medical Officer of Health of Winnipeg, and Dr. T. A. Pincock, Deputy Minister, Department of Health and Public Welfare of the Province. It has been published for the Department of Health and Public Welfare by the Great-West Life Assurance Company.

Full of information obtained directly from the experience of this epidemic, the report is of probably the greatest significance in that section dealing with the use of convalescent serum, which is reproduced in full on pages 235 to 240. The other sections,—on organization; on the preparation of convalescent serum; on the epidemiology of the disease as shown in Manitoba, the extent in time and place, the age groups involved, the multiple of cases in families, the apparent incubation period; the symptoms and physical signs as found on careful examination; and the control methods employed—all these add much to our knowledge. The main features are shown in the extracts which comprise this review, chosen freely from the various sections.

The Chairman of the Committee was C. R. Gilmour, M. D., and the Secretary, A. T. Cameron, D.Sc.

## ORGANIZATION

At a meeting of the Board of Health on August 16th, 1928, it was decided that the Medical Research Committee of the University of Manitoba should be authorized to prepare convalescent serum for use in the treatment of poliomyelitis, and that the investigation of the present epidemic as to etiology, clinical course, and treatment, should be undertaken by the Committee, and that the Board of Health should delegate to the said Committee all matters connected with the scientific aspect of the problem.

This resolution was communicated verbally at that time to the secretary of the Committee, and confirmed subsequently by a letter from the Hon. Dr. E. W. Montgomery, Minister of Health and Public Welfare, to the Chairman of the Committee, in which letter it was stated further that the Board of Health would be responsible for the necessary financial outlay, and would be pleased to co-operate at all times with the Committee.

The Committee met on Friday, August 17th, Dr. Cadham being present by invitation. The following resolution was passed: "That the Committee will attempt to obtain and handle supplies of poliomyelitis serum, and make regulations for their proper use and the interpretation of results, working in conjunction with the Professor of Bacteriology."

At a further meeting on August 30th, a sub-committee was appointed to carry on the work with full powers. This consisted of Dr. C. R. Gilmour (Chairman), Dr. F. T. Cadham, Dr. J. M. McEachern, Dr. Bruce Chown, and the Secretary.

For the purpose of investigation, two honorary consultants acted for the Committee. As far as possible, all suspected cases occurring in the City of Winnipeg were seen personally and examined by these consultants or by two other physicians, who were later chosen to assist.

Following the routine established in earlier epidemics elsewhere, the consultant carried equipment which permitted expeditious examination and immediate injection of serum when this was considered desirable. The equipment consisted of:

(a) Thermometer and percussion hammer; (b) (for lumbar puncture) iodine, 95 per cent alcohol, absorbent sponges, sterilized lumbar puncture needles, test tubes, local anaesthetic (1-2 per cent novocaine), sterilized syringe and needles for local anaesthetic, C. and E. mixture, and anaesthetic mask; (c) (for cell count and globulin estimation) white blood cell pipette, diluting fluid (gentian violet, glacial acetic acid, and water), Fuchs-Rosenthal counting chamber, microscope, and Pandy's fluid; and (d) (for administration of serum) vials of serum for intramuscular and intravenous injection, sterilized syringes and needles, and tourniquet.

The necessity for serum was recognized very early, and was at first prepared by Dr. Cadham and assistants in the Provincial Laboratory. During August, the demands for serum were not many, and the supply was sufficient to meet the demand. After the emergency meeting of the Winnipeg Medical Society on August 30th, demands for the serum greatly increased. A notice was inserted in the daily papers asking all persons who had had poliomyelitis formerly and were willing to give some blood to phone the Committee.

This gave immediate results. A large number of donors were obtained, and these sent others, and subsequently no shortage of donors was experienced.

Donors were paid at the rate of \$5.00 for 50 cc. of blood or less; \$10.00 for 50 to 100 cc. and for larger amounts accordingly.

In all 113 donors were used 201 times. Of these 56 were used once only, 40 twice, 9 three times, 3 four times, 4 five times, and 1 six times. Ten cases from the present epidemic were used in all fifteen times. Three cases that had occurred 30, 31 and 33 years before were each used a single time. Practically all the serum was pooled.

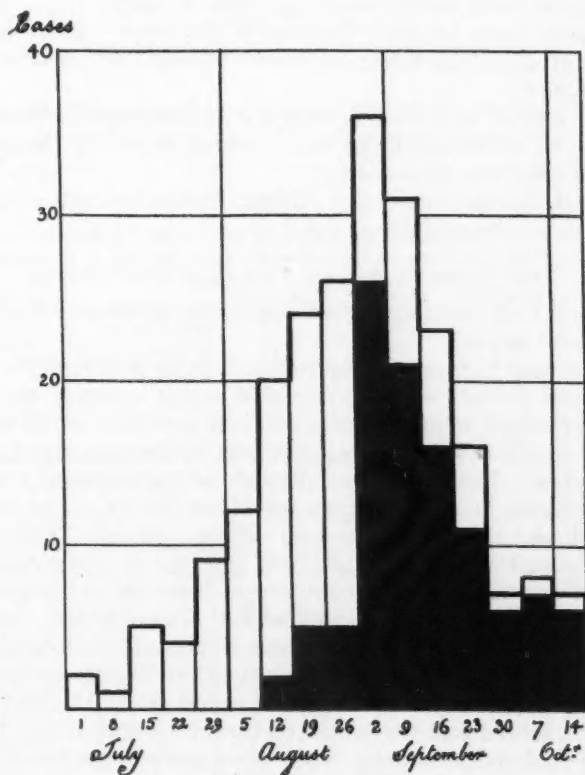
On September 4th, the Committee established a 24-hour service in its laboratory for the issue of serum. This proved very useful, since a large proportion of the calls for serum were during the late evening (long distance) or the first hour or two after midnight. Immediately on receipt of long distance calls, whether received directly or through the Provincial Board of Health, in all cases where there was the least suspicion of poliomyelitis, serum was despatched by the quickest route.

At the height of the epidemic, some serum was received from Trail, B.C., and from Toronto, Ontario. Over ten litres of serum was issued

from September 4th to November 15th, the very large part of which was provided by Winnipeg itself.

The extent of the use of serum compared to the extent of the epidemic in the City of Winnipeg, is shown in Figure I.

FIG. I



ALL CASES AND CASES TREATED WITH SERUM IN WINNIPEG.

□ Cases

■ Cases treated with Serum

The Committee draw the following conclusions from their endeavours to obtain serum: Since it is essential that serum be obtained in the pre-paralytic stage of the disease if it is to be of service:

1. Each community must depend upon its own supply of donors. Lists of such donors should be kept by the health authorities, and should be periodically checked and their addresses kept up to date.

2. While, where the local number of donors is likely to prove inadequate, it is the obviously correct procedure to endeavour to obtain serum from outside sources, yet such serum cannot be expected in less than a week and probably not in less than ten to fourteen days after request for it, nor, unless some routine machinery has been set up at

the point of supply, can a continuous supply be reasonably requested. Moreover, such other community never knows at what moment local demand may occur.

3. The newspapers of a community can, as in Winnipeg, be of the utmost service in obtaining donors in such emergencies, and can, if they desire to co-operate properly, as they did in Winnipeg, carry out this service without unduly exciting public anxiety.

4. Donors must be paid. The rate of payment that we have made, based on rates paid for larger amounts of blood for transfusions, seems to be sufficient.

5. Sufferers in an epidemic, even if it be prolonged, cannot be relied upon to be of much assistance in furnishing blood for the preparation of serum during that epidemic.

6. Blood, however carefully packed, cannot be sent any distance. Only serum can be usefully shipped.

#### THE PREPARATION OF CONVALESCENT SERUM

Dr. Fred Cadham contributes the following article on the preparation of convalescent serum:

Persons who had previously suffered from poliomyelitis and who had not been treated with convalescent serum reported to the laboratory. They were requested to come just previous to the meal hour. Blood was withdrawn from a suitable vein in the arm, into large sterile vacuum tubes. The blood was allowed to clot at room temperature and then placed in the ice chest for fifteen hours. The tubes were centrifuged and the serum pipetted off and pooled. The serum for intravenous and intra-theal use was put up in vials without the addition of any antiseptic; to the serum intended for intra-muscular use 0.25 per cent of tricresol was added. Twenty-five cubic centimeters were placed in each vial. Four thousand cubic centimeters of the nine thousand cc. prepared were heated at 55 degrees Cent. for 10 minutes. No appreciable difference was noted in the therapeutic effect between the heated and the unheated serum. Serum direct from each vial was inoculated into deep tubes of serum glucose broth and cultured in order to test for sterility. Subsequently the serum was examined daily; this of course was possible, the supply being controlled at one central depot.

No person who had suffered an attack of poliomyelitis and who had received convalescent serum was used as a donor, because of the possibility of their blood lacking the essential antibodies.

Wassermann tests were carried out on the blood of each donor.

Four hundred cubic centimeters comprised the average amount of serum put up in any one day; thus, a patient undergoing treatment as a rule received serum prepared not more than six days previously.

Only fifty to one hundred cubic centimeters of blood were withdrawn from a donor at one time. It may be pointed out here, that frequently poliomyelitis donors are not of a robust type, and would not—or what also is important, they or their relatives believed they

could not—withstand the withdrawal of any large amount of blood at one time. Our experience was that because of the method of withdrawal of comparatively small amounts of blood at any one time, the same donors were willing to report frequently, and so a constant supply of serum was available. This I consider to be an advantage if the epidemic lasts over a considerable period of time.

### THE EPIDEMIOLOGICAL FINDINGS

The distribution of the cases according to time location age and sex is shown by Tables I, II and III. The deaths are classified in Table IV.

TABLE I  
DISTRIBUTION ACCORDING TO TIME AND LOCATION.

Month	Winnipeg	Suburbs	Rest of Province	Total
July .....	14	4	3	21
August .....	87	24	32	143
September .....	112	34	85	231
October .....	22	4	9	35
November (to 15th) .....	0	1	4	5
Totals .....	235	67	133	435

TABLE II  
DISTRIBUTION ACCORDING TO AGE.

	Winnipeg		Suburbs		Rest of Province		Total	
	No.	%	No.	%	No.	%	No.	%
Less than 5 .....	76	32.6	22	34	32	24.8	130	30.5
5 to less than 10 .....	82	35.2	31	48	38	29.5	151	35.4
10 to less than 15 .....	40	17.2	8	13	29	22.5	77	18.1
15 to less than 20 .....	22	9.5	3	5	18	14.0	43	10.1
20 to less than 25 .....	8	3.4	0	0	4	3.1	12	2.8
25 and over .....	5	2.1	0	0	8	6.1	13	3.1
Totals .....	233	100.0	64	100	129	100.0	426	100.0

TABLE III  
DISTRIBUTION ACCORDING TO SEX\*

	Males No.	Females No.	Males %	Females %
Winnipeg .....	132	102	56.4	43.6
Suburbs .....	29	26	53	47
Rest of Province .....	72	57	55.8	44.2
Total .....	233	185	55.7	44.3

\*In a few reports sex was not stated.

TABLE IV

DEATHS*				
Month	Winnipeg	Suburbs	Rest of Province	Total
July.....	2	0	0	2
August.....	10	2	5	17
September.....	3	1	11	15
October.....	2	0	1	3
November.....	0	0	0	0
Total.....	17	3	17	37

\*Classified by date of onset of the disease in the patient.

### MULTIPLE CASES IN FAMILIES

A series of observations is given of instances where more than one case occurred in a family. The intervals between the cases appear to support the contention of the longer incubation period. The observations also show the occurrence of abortive cases.

In *one* family there were four definite cases with a fifth possible case. Winona, age 5, was "ill," September 17 or 18; Donald, age 8, a definite case, onset September 18; Elaine, age 2, a definite case, onset September 18; Florence, age 4, a definite case, onset September 24; Ian, age 6, a definite case, onset September 30. It is seen that there was an interval of six days between the onsets of the third and fourth cases and between the onsets of the fourth and fifth cases. The incubation periods may, of course, have been longer.

In *one* family two definite and one doubtful case occurred—the doubtful case having its onset six days after the first case and four days after the second.

In *one* family a possible case, ill October 1st, was followed by a definite case with onset October 5, and by another definite case with onset October 11.

In each of *ten* families two definite cases occurred at intervals which appear to fall into two groups, one of 0 to 2 days, suggestive of simultaneous infection, and another of 5 to 8 days, suggestive of an incubation period of at least that duration.

In each of *eleven* families there were reported two cases or a second doubtful case. Typical examples are:

*Family Fi.* Gordon, age 3, reported, onset August 14; Shirley, age 5, reported, onset stated August 15, interval one day.

*Family Ha.* Teddy, age 4, definite case, onset August 19. Sister, age 6, ill, vomiting same day.

*Family Wal.* Dorothy, age 15, definite case, onset July 25. Sister "sick" seven days before.

The intervals in these cases fell into the two time groups as in the former series.



The following general conclusions are taken from the section of epidemiology:

The epidemic increased rapidly in both the City of Winnipeg and the rest of the Province until early in September, and decreased at approximately the same rate.

As far as accurate information permits a statement, the total number of cases between July 1st and November 15th was 435, of which 235 were in the City of Winnipeg, 67 in the adjacent suburbs, and 133 in the rest of the Province. Of the latter the Portage la Prairie district and certain other districts in the eastern half of the Province were particularly affected, there being no regular distribution. The western half of the Province was relatively little affected.

Within the City of Winnipeg, the centre showed the greatest incidence, while certain densely populated areas were practically free.

Analysing the cases in age groups of 5 year periods, the greatest number occurred in the group from 5 to below 10 years, while the number below 5 years of age was almost as great. The country showed relatively more cases above 15 years of age than did the city.

There was uniformly a greater number of males affected, the ratio being 126 males to 100 females.

Of the 37 deaths, 17 occurred outside the city and suburbs, there thus being a relatively greater proportion in the country areas.

Evidence is adduced that where contact is known, through more than one case occurring in the same family, or through other information, such cases were usually related by time intervals of less than 2 days or of 6 or 7 days. The latter period occurred in a larger number of pairs of cases in the same family than did the short interval.

It is reasonable to consider as a possibility transmission of the disease from individual to individual *in some way* at present not known.

If this be considered reasonably possible, until some additional data become available it seems most logical not only to isolate all cases rigidly as early as possible, but also as a preventive measure to advise all having the care of children to keep them away from other children (and adults) as far as possible during an epidemic.

No evidence was brought forward which would lead us to conclude that milk, or any other food, insects, animals, or insanitary environment had anything to do with transmission. Particulars regarding these factors were obtained in each city case.

The question of unrecorded abortive cases has not been considered. We have indirect evidence that a large and quite indeterminate number of doubtful and probably abortive cases occurred; and the actual numbers stated, though they include several doubtful and unverifiable cases, must be considered as distinctly less than the actual number of cases that occurred.

#### CLINICAL AND LABORATORY FINDINGS IN THE ONE HUNDRED AND SIXTY-ONE CASES STUDIED

*Spinal Fluid.* Spinal fluid observations are recorded in 116 cases out of 161. Cell counts were made in all these 116 cases. Ninety-

two or 79 per cent of the fluids showed a cell count between 10 and 200 cells. The counts ranged from 10 to 1809 cells.

TABLE V  
CELL COUNTS IN 116 CASES.

Count	Cases	Count	Cases	Count	Cases
10- 49.....	44	300- 349.....	0	600- 699.....	2
50- 99.....	24	350- 399.....	0	700- 799.....	0
100- 149.....	11	400- 449.....	2	800- 899.....	0
150- 199.....	14	450- 499.....	1	900- 999.....	0
200- 249.....	8	500- 549.....	0	1000-1499.....	3
250- 299.....	4	550- 599.....	3	1500-2000.....	1

As found by previous observers the prognosis was as a general rule more serious with the higher cell counts. There are many individual exceptions to this rule though it holds for both treated and untreated cases.

TABLE VI

RELATION OF PROGNOSIS TO SPINAL FLUID COUNT				
	No. of Cases	Percent Recovery	Percent Paralyzed	Percent Deaths <sup>11</sup>
10- 99.....	68	72	22	6
100-199.....	24	58	29	13
200-299.....	12	58	42	0
Over 300.....	12	50	33	17

*Urinalysis.* Urinaylsis was done in 77 cases. Of these 54 were negative, 23 showed a marked albuminuria, 14 revealed gross and microscopic blood, 3 had gross pus in the specimen.

*Leucocyte Counts.* Leucocyte counts were done in 43 cases: 12 were under 10,000, 23 between 10,000 and 14,000 per cu. mm. and 8 gave counts of over 15,000. In other words, 31 cases out of 43 showed a leucocytosis. Lymphocytosis was the rule.

*Onset of Paralysis.* Of the 90 cases in the group who became paralysed, 51 were paralysed by the third day. The peak of the onset of paralysis was also reached on the third day as seen in Table VII.

TABLE VII  
ONSET OF PARALYSIS

Day	Number of Cases
1.....	8
2.....	14
3.....	29
4.....	19
5.....	7
6.....	1
Over 7.....	12
	<hr/> 90

In this series of cases it will be seen that less than 10 per cent of those developing paralysis showed paralysis on the first day, the majority not until the third day, about 20 per cent on the fourth day and about 20 per cent later than the fourth day.

Summarizing findings on the different days, one finds that fever was the most constant finding, being found in 87.5 per cent, frontal headache in 80.3 per cent, stiff, sore neck and back in 73 per cent, lumbar pain in 50.6 per cent anorexia in 46.7 per cent, malaise in 44.7 per cent, vomiting in 41.4 per cent, and pain in the limbs in 37.5 per cent, paresis in 32.8 per cent, paralysis in 17.1 per cent. A rash was seen in only one case. The spine sign was present in 73.1 per cent. There was rigidity of the neck in 51.8, paresis or paralysis in 49.3 and Kernig sign in 36.5 per cent.

#### PATHOLOGICAL FINDINGS

In considering the pathology of the epidemic, Dr. Wm. Boyd, Professor of Pathology, University of Manitoba, notes as follows:

Autopsies were performed on five cases of poliomyelitis. In two of these the examination was confined to the central nervous system. In three a complete post mortem examination was made.

The lesions found in the nervous system were those recognized as being characteristic of the disease. They were in no way unusual. There was evidence of a severe inflammation most marked in the grey matter but also present in the white matter, involving the whole of the cord and the brain stem. Marked lesions were found in the medulla, pons, and mid brain, but above that level there was a sudden disappearance of the lesions. None were found in the basal ganglia or cerebral cortex.

In the cases in which a general examination was made no definite evidence was found in support of the idea that the disease is a septicaemia. The inflammatory lesions were entirely confined to the central nervous system.

#### CONTROL MEASURES

In connection with the control in the City of Winnipeg, Dr. Douglas points out the use of hospitalization, supervision, isolation, quarantine, concurrent and terminal disinfection. In regard to schools, Dr. Douglas says:

The opening of the city schools, public and parochial, private schools, and Sunday schools was delayed one month. This procedure was decided upon at a meeting of the Provincial Board of Health with the school authorities. It was recognized that this measure was of doubtful efficacy, as regards prevention of spread. It was valuable, however, in the sense that it went a long way to allay public alarm or anything in the nature of panic; indeed, it was demanded by a large number of our people. In this connection the daily newspapers of the city performed a great service to relieve uneasiness through the intelligent and common-sense way they handled news regarding the outbreak. Nothing was held back; the seriousness of the situation

was not minimized, but no scare stories or exaggerated statements were printed. Six short articles on poliomyelitis prepared by members of the Winnipeg Medical Society, were published in the press.

Dr. Pincock discusses Provincial control under the following heads:

- (a) Co-operation of the municipal health officers.
- (b) Co-operation of the medical profession.
- (c) Publicity through the press as a means of educating the public.
- (d) Isolation and quarantine.
- (e) Concurrent disinfection.
- (f) General measures.

In connection with (b) and (c) above, he says:

(b) *Co-operation of Medical Profession.* The beneficial effects of a close working co-operation between the medical fraternity and officials of health departments were amply demonstrated. On August 26th, a special meeting of the Winnipeg Medical Society was called by the executive of the society. Papers were presented dealing with the Pathology, Symptomatology, Bacteriology, Serum Therapy, Epidemiology, and treatment of the aftermath of the disease, and fully discussed. At this meeting there was appointed an editorial committee of the Medical Society especially acquainted with the phases of the subjects enumerated above.

(c) *Publicity as a Means of Education of the Public.* The function of this Educational Committee was to see that material submitted to the Press was of such a nature as to meet with the approval of the profession, that it be informative without being unduly technical and at the same time quiet the fears of the public. The result of this publicity was evidenced in early diagnosis, more thorough reporting and greater demand for serum.

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# The Results of Convalescent Serum Therapy in Acute Poliomyelitis in the Manitoba Epidemic, 1928\*

By

JOHN M. McEACHERN, M.D., BRUCE CHOWN, M.D., LENNOX G. BELL, M.D., AND MARY McKENZIE, M.D.†

**D**URING the recent epidemic of poliomyelitis in Manitoba the responsibility for the preparation and distribution of convalescent serum was delegated to the Medical Research Committee of the University of Manitoba. The serum was prepared under the direction of Dr. F. T. Cadham, and a number of us were appointed to act as honorary consultants for the Committee, to assist in the distribution of the serum, and to render aid if necessary in the diagnosis of the disease.

As a result of this action the Medical Research Committee was able to regulate the supply of serum, reserving it for definite cases, and to obtain accurate histories and follow-up examinations in a large number of cases.

Of the cases seen by us 161 have been selected for the present report. The bases of selection were simply, first, a positive diagnosis, and second, the accuracy of the records obtained. If the characteristic symptoms of the disease were confirmed by a spinal fluid count of over 10 the case was considered to be definitely poliomyelitis. If in the absence of a cell count paralysis followed an acute febrile illness we felt justified in using this case in our series. Since only one patient who had a normal cell count developed paralysis, and the diagnosis of peripheral neuritis has not yet been ruled out in this case, we did not feel justified in including suspects of this type.

The serum used was the pooled, sterile, Wassermann negative, blood serum of from 6 to 8 donors. These donors had had the disease from a few months to 33 years previously, each donor's case having previously been confirmed from original sources and by examination. Only ten donors were employed who suffered from the disease during the present epidemic.

The intramuscular use of convalescent serum is not new. Notable studies with this method have been published by Shaw and Thelander<sup>1</sup>.

Following the suggestion of Professor F. T. Cadham the intramuscular method of administration was used almost exclusively in the Manitoba epidemic. Standard doses of 25 cc. were used in the pre-

\**The Report of the Poliomyelitis Epidemic in Manitoba, 1928.*

†Gordon Bell Fellow.

paralytic stage of the disease. Subsequent doses were given by the same method if the disease was found to be progressive. Only a small number of cases received the serum intravenously or intrathecally.

Over 8,000 cc. of serum were administered during the course of the epidemic, 98 per cent of which was obtained from local donors. In no instance was there an immediate or late unfavourable reaction following the administration of this serum. Nor was there a single instance of infection following its use, which speaks well for the method of preparation.

The convalescent serum treatment of poliomyelitis rests upon the observation of Romer and Joseph<sup>2</sup> that immune bodies are present in the blood of recovered cases. The experiments of Flexner and Lewis<sup>3</sup> show that the injection of such serum delays and may altogether prevent the onset of paralysis in monkeys previously inoculated with the virus. Netter<sup>4</sup> was first to treat human cases with convalescent serum.

Much valuable work has been done in this field by Peabody, Draper, and Dochez<sup>5</sup>, Amoss<sup>6</sup>, Aycok and Luther<sup>7</sup>, Shaw and Thelander<sup>1</sup>, and others, but the value of this treatment is still held in doubt by many observers. The chief handicaps to fair judgment on this problem are an insufficient number of control cases, the tendency of the virus to become attenuated in the later months of the epidemic, and the fact that a large number of patients recover without treatment. It is also well known that cases occurring in country districts are more severe than the urban ones. This prevents the use of the country cases as controls. It is felt that all these factors have been disposed of in the present study.

Of the 161 cases here reported 74 received serum in the pre-paralytic stage of the disease, 54 received no serum, and 33 cases received serum too late to be of much value, that is, after the onset of paralysis. Each of the 161 cases was seen by one of us. Fifty per cent were studied by Dr. Lennox Bell in the King George Hospital. The remainder were seen several times by the consultants of the Committee.

In the following analyses, by early paresis or paralysis is meant the occurrence of such a catastrophe in the early stage of the disease, usually between the 3rd and 10th day. If paralysis or paresis was definitely found between the 3rd and 4th week of the disease it was termed residual paralysis or paresis. (These end results it is hoped will be further checked after 5 or 6 months.) Since all the cases were checked at approximately the same stage the results are comparable.

The series has been divided into four groups:

Group 1 consists of 57 cases which received an average of 25 cc. of serum intramuscularly in the pre-paralytic stage of the disease. 93 per cent made a complete recovery. There were no deaths.

Comparison of these results with those in Group IV who received no serum at all is interesting. Of the 54 cases in Group 4 only 26 per cent made a complete recovery. Eleven per cent died and the remainder were paralyzed.

Group II consists of 17 cases which received one or more doses of



serum by various routes, or which received more than one dose of intramuscular serum. The results are approximately the same as those of Group I.

Group III consists of those cases which received serum after the onset of paralysis. Of these 57 per cent became paralysed before the fourth day. (Only 41 per cent of the cases which received no serum were paralysed by the fourth day.) Group III numbered 33 cases. Of these only 22 per cent made a complete recovery, 33 per cent died, and 45 per cent became paralysed. General observations upon these figures would seem to indicate firstly that the earlier the onset of paralysis the worse is the prognosis, and secondly, that serum is of little value once paralysis has ensued. The fact that the cases in this group became paralysed at an earlier date may explain why serum was not administered in the pre-paralytic stage.

These findings are summarized in Tables I and II.

TABLE I

	No.	%
Total cases .....	161	100
Total deaths .....	17	11
Total residually paralysed .....	54	33
Total completely recovered .....	90	56

TABLE II

## RESULTS IN TREATED AND UNTREATED CASES

Group	Number of Cases	Number Completely Recovered	Percent Completely Recovered	Number Showing Residual Paralysis	Percent Residual Paralysis	Deaths	
						No.	%
I.....	57	53	93	4	7	0	0
II.....	17	16	94	1	6	0	0
III.....	33	7	22	15	45	11	33
IV.....	54	14	26	34	63	6	11

Group I—1 dose intramuscular serum in pre-paralytic stage.

Group II—2 or more doses of serum by various routes (pre-paralytic stage).

Group III—Serum given after onset of paralysis.

Group IV—No serum given.

Granted that the virus becomes attenuated in the later stages of an epidemic, in order to prove conclusively that serum is effective it becomes necessary to compare the figures during one given month of the epidemic. That there is such a decrease in severity is shown in Table III.

TABLE III

## RESULTS IN UNTREATED CASES IN AUGUST AND SEPTEMBER

	Number of Cases	Early Paralysis %	Residual Paralysis %	Deaths %	Complete Recovery %
Cases without serum treatment in August.....	28	96	68	18	14
Cases without serum treatment in September.....	22	82	59	5	36

If, however, we compare the results of serum treatment with those of the controls, for the month of September, we find that the decrease in virulence indicated in Table III is much less evident than the improvement indicated by the figures for treated cases shown in Table IV. For example, of the 22 cases in September who received no treatment, 36 per cent made a complete recovery, while of the 50 cases in the same month who received serum in the pre-paralytic stage, 94 per cent made a complete recovery.

TABLE IV  
RESULTS IN TREATED AND UNTREATED CASES IN SEPTEMBER

	Number of Cases	Early Paralysis %	Residual Paralysis %	Deaths %	Complete Recovery %
No serum . . . . .	22	82	59	5	36
Serum in pre-paralytic stage . . . . .	50	10	6	0	94

It is generally recognized that the effect of the virus is greater in the country than in the city—that cases are more severe in the rural districts. If our control cases were entirely from the country and the treated cases from the city our results would be open to criticism. In Table V the September cases are further divided into those from the city and those from the country.

TABLE V  
RESULTS IN TREATED AND UNTREATED CASES OF THE CITY AND COUNTRY IN SEPTEMBER

CITY CASES	Number of Cases	Early Paralysis %	Residual Paralysis %	Deaths %	Complete Recovery %
No serum . . . . .	14	86	50	7	43
Serum in pre-paralytic stage . . . . .	43	7	5	0	95
COUNTRY CASES					
No serum . . . . .	8	75	75	0	25
Serum in pre-paralytic stage . . . . .	7	29	14	0	86

A final criticism may be raised: Are not the beneficial results observed in the serum-treated cases due to the fact that they are milder cases, that the controls for the most part are those seen after paralysis has occurred?

This objection is not so easily disposed of, but we may answer it from several different angles.

First, the marked actual differences in percentages of complete recovery between the treated cases and the controls in September should in themselves be sufficient to over-ride this objection.

Secondly, during that month nearly every case occurring in the

city was seen by the Committee, and there is no reason to suppose that the severe cases were almost entirely absent from the treated group of nearly 60 cases.

Thirdly, if we assume that serum has no therapeutic value whatever, an accurate analysis according to the statistical method by a qualified statistician has shown that the results shown in Table V could only occur once in five hundred times. The arbitrary level of significance is taken to be one in thirty.

Fourthly, following Draper's view that a cell count of over 100 indicates a serious type of disease<sup>8</sup>, a comparison of the cell counts in treated cases and controls in Table VI shows no appreciable difference in numerical incidence of the counts, from which it would follow that there is no significant difference in the average severity of the two groups of cases. 92% of these counts in the treated cases were made by the fifth day of the disease. 82% were made by the fifth day in the controls. The difference of 10% is not felt to be significant as there is no marked change in the cell counts during the first week of the disease. (Peabody<sup>5</sup>).

TABLE VI

CELL COUNTS IN TREATED AND CONTROL CASES		
Cell Counts	Treated Cases	Control Cases
10- 99.....	36	23
100- 199.....	12	10
200- 299.....	6	4
300- 399.....	0	0
400- 499.....	2	1
500-1000.....	2	2
1000-2000.....	2	0
Total.....	60	40

Finally, it is felt that a comparison of the results in cases which had early paresis or paralysis with the end results will give us the true index of recovery in treated and untreated cases. It is well known that the initial lesion is the ultimate reaction to the virus. For example, no case which initially developed paresis without paralysis, subsequently—that is after a lapse of three or four weeks—developed paralysis. The results of the comparison are seen in Tables VII and VIII.

#### IMMEDIATE RESULTS FOLLOWING THE USE OF THE SERUM

Within a few hours following the use of the serum the usual result was a drop in temperature and complete recovery from most of the symptoms complained of. It should be noted, however, that a drop in temperature and apparent beneficial results following the use of the serum occurred in cases afterwards proved to be ordinary febrile disturbances and not poliomyelitis. This, of course, does not detract

from the therapeutic value of convalescent serum in poliomyelitis, but indicates that some part of the beneficial effect may be due to other than specific factors in the serum.

TABLE VII

END RESULTS IN CASES WHICH HAD EARLY PARESIS OR PARALYSIS			
	Number of Cases	Percent Recovered	Percent Residual Paralysis or Death
Treated Groups I and II .....	13	62	38
Control Groups III and IV .....	82	20	80

TABLE VIII

RESULTS IN CASES WHICH HAD EARLY PARESIS ALONE			
	Number of Cases	Percent Recovered	Percent Residual Paralysis
Treated Groups I and II .....	12	67	33
Control Groups III and IV .....	30	40	60

These results seem to justify the use of serum in the pre-paralytic stage.

#### CONCLUSIONS

1. Convalescent serum is of value when administered in the pre-paralytic stage of the disease.

2. The intramuscular route of administration is simple, safe, and sufficiently efficacious to justify its use during an epidemic.

#### REFERENCES

- <sup>1</sup>Shaw and Thelander, *J. Am. Med. Assoc.*, 1928, xc, 1923.
- <sup>2</sup>Romer and Joseph, *Munch. Med. Wochenschr.*, 1910, lvii, 568.
- <sup>3</sup>Flexner and Lewis, *J. Am. Med. Assoc.*, 1920, lv, 662.
- <sup>4</sup>Netter, quoted by Draper, Nelson's "Living Medicine," Vol. II, p. 67.
- <sup>5</sup>Peabody, Draper, and Dochez, *Monographs Rockefeller Inst. Med. Res.*, 1912.
- <sup>6</sup>Amoss, *J. Am. Med. Assoc.*, 1917, lxviii, 994.
- <sup>7</sup>Aycock and Luther, *J. Am. Med. Assoc.*, 1928, xci, 387.
- <sup>8</sup>Draper, "Acute Poliomyelitis," Philadelphia, 1917.

# Dangers of Unpasteurized Milk with Special Reference to Malta (Undulant) Fever

NORMAN MACL. HARRIS, M.B.

*Chief, Laboratory of Hygiene, Department of Pensions and National  
Health, Ottawa*

IN this day and generation it almost seems superfluous to speak on the subject of unpasteurized milk and the obvious dangers to health that may follow its use. Still one must, I suppose, take into consideration the existence of dark corners, in the minds of some, even though the sunlight of knowledge glows about us, and attention must again be drawn to this theme.

In communities where milk is as yet consumed raw, the neglect to pasteurize, or, pasteurization on a partial scale only, may be accounted for by a variety of causes. These may be summed up as due to ignorance, imperfect conception of the principles of pasteurization, lack of capital to set up a plant, even a small one, a false sense of duty in larger communities where the cry may be raised against squeezing out of the small producer, enhancement of the price of the pasteurized product, and the parrot chatter that the milk is denatured, i.e., robbed of vitamins and bone-forming salts,—and all the while no thought is given to the other side of the picture so vital to every community, that raw milk, through a variety of circumstances, may be the conveyor of diseases, the cause of long physical disabilities and even death, or, in less degree be responsible for loss of wages through illness, with consequent family impoverishment among classes so little able to bear the result of such dire happenings.

## DISEASE PROPAGATION

As to the dangers lurking in raw milk supplies, the excellent pioneer work of Park<sup>1, 2</sup> in 1901-03 in New York City opened the eyes of the world to the dangers of raw milk heavily contaminated with bacteria. He clearly showed that the high bacterial content of milk of large communities was largely due (a) primarily to the unsanitary, dirty method of milking, (b) to the subsequent unsanitary handling of milk after leaving the farm, and (c) to the lack of refrigeration. The results were clearly shown in the high infant mortality, especially in the hot months of summer. Following his recommendations, the introduction of clean, sanitary methods of milking, improved methods of handling and ultimate pasteurization, infant mortality rates have

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fallen off in most remarkable ways the world over wherever such methods have been introduced.

In addition to such considerations, it must be recognized that the average raw milk supply of cities and towns may convey disease to the human family through two main sources: first, from disease existing in the herds supplying milk, and second, from the subsequent handling of the milk by persons either suffering from communicable diseases, or being active carriers of disease germs (i.e., those who have recovered from disease but still excrete bacteria, or, have not appreciably suffered from disease, but in whom germs have lodged, are multiplying somewhere in the body and are being excreted), or by those in intimate contact with cases of communicable disease who at the time also engage in dairying pursuits.

The more common diseases from these sources may be listed as follows:—

- A. From the cow: Tuberculosis, garget, septic infections (from diseases of the udder), undulant fever (contagious abortion). Anthrax and foot-and-mouth disease may also be mentioned.
- B. From human sources: Typhoid and paratyphoid fever, diphtheria, scarlet fever, septic sore throat and possibly poliomyelitis.

The importance of promptly dealing with such dangers must strike forcibly even the most slow-witted among those in municipal offices, for the literature dealing with the public health side of the milk industry bristles with incontrovertible data showing how raw milk supplies, improperly supervised, have been in the past responsible for thousands of infant and adult deaths; and this, in communities unprotected by pasteurization, is still going on.

#### DISEASES OF THE COW TRANSFERABLE BY MILK TO HUMANS

Considering some of the diseases among those directly conveyed by the cow: 1. *Tuberculosis* is by far the most important and is responsible for about 10 per cent of infant deaths from all forms of tuberculosis, without any reference to the prolonged illness and physical deformities among those who perchance may recover, but who shamble among us deformed or crippled for life. 2. *The pyogenic micrococci*, causing *septic inflammation of the udder*, may be quite capable of inducing tonsillitis, pharyngitis, enteritis, and their sequelae. 3. *Malta (undulant) fever* has long been considered by most of us as being practically a disease of the sub-tropics, largely spread by the use of goats' milk, but in 1897, Bang<sup>3</sup> of Copenhagen described the isolation of an organism from cows and their aborted calves in cases of contagious abortion, which in all respects tallied with the organism described by Bruce<sup>4</sup> in 1887, as being the cause of Malta or undulant fever. His work has in the intervening years been amply confirmed in Europe, America and other parts of the world. The importance of this type of infection for human beings was not essentially and unequivocally recognized until 1924. Since then the number of recorded cases has



grown rapidly, particularly in the United States. Reference will be made more especially to this infection later.

#### DISEASES OF HUMAN ORIGIN CARRIED BY MILK

Referring now to the diseases transferable by raw milk contaminated by human agency: The literature for many years past has recorded outbreaks of typhoid fever, paratyphoid fever, diphtheria, scarlet fever, septic sore throat and cholera, so that it is needless for me to occupy time at this juncture in giving citations, but suffice to say that the evidence presented is weighty and not to be denied.

It is interesting to observe the manner in which the raw milk becomes the vehicle of infection. There are two main channels of infection to be noted. In the first instance, dealing with typhoid or paratyphoid fever, inasmuch as cows cannot be infected by the milker or handler of milk, the infection is usually direct. The bacilli gain entrance through fingers contaminated by urine or fæces of the person who may himself have the disease in a florid state, or may be a carrier. The organisms can multiply relatively rapidly so that the whole output of a dairy may be thoroughly infected. In less degree, milk cans or bottles may be infected in washing by individuals ill of the disease, or by carriers, or by using water polluted by typhoid-bearing sewage. In a similar manner, too, may diphtheria, scarlet fever and septic sore throat be disseminated. As regards this latter disease, our press recently carried dispatches in reference to a severe outbreak in Lee, Mass. This epidemic of septic sore-throat began July the 1st in Lee, Mass., a town of about 4,000 persons. It was spread through the use of raw milk, and over 600 people were infected and 36 died. Cultures of a hemolytic streptococcus were obtained from one cow and a number of milk-handlers. The outbreak was brought under control by enforcing a local ordinance compelling pasteurization, or boiling of all milk, and the epidemic was over by July 14th. As Dr. George H. Bigelow, Commissioner of Health, Massachusetts, remarked, "the moral of it is that raw milk is a very potent vehicle for the transmission of disease."

The second channel of infection lies in the ability of the milker to infect the udder of the cow, which secondarily infects the milk. The proof of this method of infection is for septic sore throat, upon the whole, trustworthy, and again in such manner may diphtheria and scarlet fever be broadcast through raw milk.

The attention of those who oppose pasteurization of milk is earnestly called to the publication by Armstrong and Parran<sup>5</sup> in the United States Public Health Reports of 1927, in which they report 612 epidemics of communicable diseases in the United States propagated in far the greater part through raw milk, by improperly pasteurized milk, and even by certified milk. They compute that there were 42,327 cases with 410 deaths from this cause between 1908 and 1927.

It is not within the province of my paper to discuss the question of pasteurization of milk in any of its details, but it is permissible for me,

after giving the foregoing data, to remark briefly upon the question of safeguarding milk supplies. Fundamentally, milk should be produced under scrupulous sanitary conditions, in which are involved veterinary inspection, clean cows, clean and sanitary stables, and medical inspection of all who are engaged in handling of milk, from milker down to the last man in the chain concerned in passing on milk to the consumer. I can do no better than refer to that concise and most instructive paper by Dr. J. W. S. McCullough<sup>6</sup> entitled "Pasteurization of Milk," in which the arguments for the method of making milk safe are irrefutable; and, as showing how even small communities may avail themselves of the boon, I would refer to a brochure compiled by Mr. B. Evan Parry and issued by the Department of Pensions and National Health under the title of "Pasteurization of Milk for Small Communities—Pub.No. 36."

#### MALTA (UNDULANT) FEVER OR BRUCELLA ABORTUS INFECTION

To return now to the special consideration of milk infected by *Brucella abortus*, the causative agent of contagious abortion in cattle: The importance of this type of infection for human beings was not fully recognized until 1924, when complete bacteriological proof was first established by Keefer in Baltimore, Md. although it had been shown some years earlier that *Br. abortus* was excreted in the milk of infected cows, and inferences (without bacteriological proof) were drawn by several writers that otherwise unaccountable attacks of undulant fever might be ascribed to such a source. Since then the number of recorded cases in various parts of the world has grown rapidly, particularly in the United States. In Canada, no case was reported until June 1928 when two reports appeared simultaneously in the *PUBLIC HEALTH JOURNAL*, one by the writer<sup>7</sup> and his colleagues, McCoy, Stevens, and Lyman in Ottawa, and one by MacLean<sup>8</sup> and his colleagues McKinnon, Young and Jeffrey in Toronto. Following these reports, the occurrence of further infections in Canada have been reported by Warner and MacLean<sup>9</sup>, and by Scozzafave and Warner<sup>10</sup>, as occurring at Welland, Ont. Since reporting my earlier cases, positive diagnoses have also been made in our laboratory in cases originating in Pakenham and Clarksburg, Ont., respectively, and in another coming from Cleveland, Ohio.

In the United States, this infection has been proved to be widespread from coast to coast, with strongly infected foci in Iowa, Illinois and Michigan; and there is no reason to believe but that in Canada similar conditions prevail in certain localities and only await recognition. Let me quote from a letter from Dr. E. A. Watson, Chief Pathologist, Health of Animals Branch, Department of Agriculture, Ottawa, in reply to an inquiry I made of him relative to the geographical distribution of contagious abortion among cattle in Canada:—"Bovine infectious abortion (*Bacillus abortus*, Bang) has not yet been included with the diseases dealt with under the Animal Contagious Diseases Act in Canada. Consequently, it is not a notifiable disease. It is well known, however, that the infection is extremely prevalent all over Canada, and it is said that the economic loss to the livestock industry from abortion disease and its sequelæ, sterility, etc., is greater than that

resulting from any other known disease. It has been very prevalent in the Ottawa district for a number of years and occurs with greater or less frequency from year to year, some herds acquiring more or less immunity, while others, especially where additions to the herd from outside points are made periodically, experience considerable losses."\*

Such then is the potential situation, and it is left to us to guess what the actual situation may be. Hardy<sup>11</sup>, who published a paper on the situation in Iowa as he found it a year ago, has stated in a recent personal communication (October, 1928) that, in his laboratory up to July 1st, 1928, 83 cases have been identified both clinically and by the agglutination test, and since that date 40 more cases passed the standard agglutination test of a 1:80 dilution—in all, 123 cases. In large measure, the infection was due to consumption of raw milk or cream.

The situation in Denmark, as shown by the studies of Kristensen<sup>12</sup> and extended by Madsen<sup>13</sup>, is of great interest. Between April 1st, 1927, and April 1st, 1928, of 2,500 blood samples sent in from 2,100 patients for Widal tests, 222 persons' blood reacted positively in 1:100 dilution with Br. abortus. In 27 cases blood culture was attempted, with 18 positive findings. It is of importance to note also that of these 2,150 patients, 172 gave a positive Widal test for typhoid fever and 126 for paratyphoid B infection, but there were more abortus infections found than either typhoid or paratyphoid alone. In only five of these 298 cases with positive Widal's was there any positive reaction with Br. abortus, and clinically these were undulant fever. The infection, it is assumed in the absence of other apparent sources, came from either raw milk, cream or fresh butter.

It is not my express purpose at this time to go into the biological aspects of the causative factor in this disease beyond saying that although at times being somewhat less coccoid than Bruce's "Micrococcus" melitensis, it is culturally identical, but shows group differences serologically. This and other highly important facts concerning Br. abortus are dealt with in extenso by Dr. Alice Evans, Hygienic Laboratory, Washington, in her excellent contributions to this subject<sup>14</sup>, which largely form the groundwork of present day research in this field. One other note of biological interest has been put forward by Professor Theobald Smith<sup>15</sup> just recently, wherein, discussing variations in the type of parasitic organisms due to change in hosts, he cites the "more or less sudden sporadic appearance of undulant or Malta fever at a distance from its supposed centre about the Mediterranean." In explanation of this, he advances the idea that the organism has relatively recently on this continent developed a pathogenicity for man, although to his knowledge it has been present in cattle since 1893 without causing apparently any infection in human beings, and is due to infection of swine from cattle. In this passage the virulence of the organism is greatly exalted and then re-infection of cattle occurs with this more virulent strain, resulting in the appearance of the disease in man.

\*The reader is referred also to two papers presented at the meeting in Winnipeg and published in this journal in February, 1929. These are: *Bovine Infectious Abortion and Its Relationship to Public Health*, by Dr. Chas. A. Mitchell; and *Undulant Fever in Ontario*, by A. L. McKay and A. L. McNabb.

Faced with the seriousness of this situation, the time has now arrived in my opinion when active measures must be undertaken by all provincial health authorities, by issuing instructions to their various diagnostic laboratories that where negative Widal tests for typhoid or paratyphoid fevers are encountered, an agglutination test be carried out for undulant fever by means of a suitably sensitive strain of *Brucella abortus*; and contrariwise, where material is sent into the laboratory as suspected undulant fever, one should not fail to do a Widal test for typhoid and paratyphoid fevers, if the *abortus* test is negative.

As this disease is serious and conveyed by raw milk in any form, it is now more pressing than ever for health authorities to insist upon the thorough pasteurization of all raw milk supplies. That this procedure will give ample protection, is borne out by the work of Park<sup>16</sup>, who states that *Br. abortus* is destroyed in ten minutes' exposure at 140°F., so that no special technic in pasteurization has to be devised in meeting this menace. In the home, in isolated parts of the country, protection is afforded by boiling the milk.

In conclusion, I may say that if the practising physician is alert to suspect any continuous fever and promptly appeals to the health authorities for a diagnosis, and they in turn take measures to locate the focus of infection and deal actively with it, we may be hopeful in the near future of suppressing a situation which in some urban and in many rural sections of our country threatens to become a serious menace to the health of our citizens.

## BIBLIOGRAPHY

- <sup>1</sup>Park, W. H.—The Great Bacterial Contamination of the Milk of Cities. Can it be lessened by the Action of Health Authorities? *Jr. Hyg.*, 1901, 1, 391.
- <sup>2</sup>Park, W. H., and Holt, L.E.—Report upon the Results with Different Kinds of Pure and Impure Milk in Infant Feeding, etc.—*Arch. Ped.*, 1903, Dec.
- <sup>3</sup>Bang, B.—Zeit. f. Thiermed., 1897, I, 241.
- <sup>4</sup>Bruce, D.—Note on the Discovery of a Microorganism in Malta Fever.—*Practitioner*, 1887, XXXIX, 161; *Ann. Past. Inst.*, 1893, VII, 291.
- <sup>5</sup>Armstrong, C., and Parran, T.—Further Studies on the Importance of Milk and Milk Products as a Factor in the Causation of Outbreaks of Disease in the United States.—*Suppl. No. 62, U.S. Public Health Reports*, 1927.
- <sup>6</sup>McCullough, J. W. S.—Pasteurization of Milk—*Public Health Jr.*, 1928, XIX, 119.
- <sup>7</sup>Harris, N. MacL., McCoy, S. H., Stevens, R. S., and Lyman, W. L.—Malta Fever in Canada: Reports of Cases.—*Public Health Jr.*, 1928, XIX, 272.
- <sup>8</sup>MacLean, D. L., McKinnon, N. E., Young, G. S., and Jeffrey, A. M.—Preliminary Report of Three Cases of Undulant (Malta) Fever.—*ibid.*, 274.
- <sup>9</sup>Warner, W. P., and MacLean, D. L.—Case Report of Undulant (Malta) Fever.—*ibid.*, 314.
- <sup>10</sup>Scozzafave, I., and Warner, W. P.—*Brucella Abortus* Infections in Man.—*Can. Med. Assoc. Jr.*, 1928, XIX, 177.
- <sup>11</sup>Hardy, A. V.—Malta Fever: A Problem for State and Municipal Laboratories.—*Public Health Reports*, 1928, XLIII, 503.
- <sup>12</sup>Kristensen, M.—Ugesk. f. Laeger, 1927, Dec. 8, 1123.
- <sup>13</sup>Madsen, Th.—League Nat., Hlth. Organ., Epidem. Rept. No. 114, 1928, May 15.
- <sup>14</sup>Evans, A. C.—Studies on *Brucella* (*Alkaligenes*) *Melitensis*.—*U. S. Publ. Hlth. Serv., Hyg. Lab. Bull. No. 143*, 1925.
- <sup>15</sup>Smith, Th.—The Decline of Infectious Diseases in its Relation to Modern Medicine.—*Can. Med. Assoc. Jr.*, 1928, XIX, 283.
- <sup>16</sup>Park, W. H.—Thermal Death Point of *Streptococci*.—*Am. Jr. Publ. Hlth.*, 1928, XVIII, 710.

# Editorials

## THE POLIOMYELITIS SITUATION

In 1927, Alberta was visited by the most severe epidemic of poliomyelitis that any province in Canada had experienced. In 1928, Manitoba suffered from an epidemic of even greater proportions, when the reported cases numbered 435. It is impossible to forecast what the incidence of poliomyelitis in the Dominion will be in 1929, but the only logical position for public health authorities is one of preparedness.

In this respect the position is somewhat different from that of even a few years ago. The experience of the past two years has added considerably to our knowledge, and in defining our position now it can be definitely asserted that we are by no means helpless in the combat of poliomyelitis; that, during an epidemic, the pre-paralytic stage can be recognized, and in that stage the diagnosis can and must be made and convalescent serum treatment instituted if paralysis and death in many cases are to be prevented; that convalescent serum is a simple and efficient means of treatment if given in the pre-paralytic stage; and that co-operation of the public health department, the practising profession and the general public, is essential in the fight against poliomyelitis. That this position is established is but a fair and reasonable conclusion from the Report on Poliomyelitis in Manitoba in 1928, prepared by the Research Committee of the University of Manitoba.

The report mentioned is a fine record of success and amply justifies the first statement that we are by no means helpless against the ravages of poliomyelitis. The pre-paralytic stage, so much stressed by Aycock yet doubted by some, is, through this report, settled beyond question. Recognition of this stage, diagnosis in this stage and treatment in this stage were essential steps in obtaining the good results in Manitoba. The pre-paralytic stage is now a necessary part in a description of poliomyelitis, and is a phase of the disease which the student must be taught to expect in all cases rather than to find in the exceptional case. It lasts as a rule from 36 to 72 hours, though it may be shorter or longer. It has certain definite characteristics which enable the physician, at a time of an epidemic, to make a tentative diagnosis on the history and physical examination. Spinal puncture will then establish the diagnosis. The report of the Alberta epidemic, appearing in this issue, gives further confirmatory evidence in this respect.

The value of convalescent serum if given intraspinally, has been



recognized for some years. In 1928, Flexner and Stewart showed that intravenous administration of convalescent serum in experimental monkeys had definite protective value. At the same time, Aycock and Luther reported very encouraging results following intraspinal and intravenous administration in human cases of poliomyelitis. In the Manitoba epidemic, convalescent serum was given intramuscularly and the results obtained, when given in the pre-paralytic stage, have established the intramuscular administration of serum as a very effective treatment. In 87 cases receiving no serum or where serum treatment was instituted after paralysis set in, there were 56 per cent showing residual paralysis and 19.5 per cent deaths. In 57 cases treated in the pre-paralytic stage with the intramuscular injection of 25 cc. convalescent serum, there were 7 per cent showing residual paralysis and no deaths. While therapeutic tests are always most difficult to control and most difficult to assess as to value, the analysis of the results obtained, as shown in the report, leaves little room for scepticism.

Another feature of poliomyelitis to which there is given confirmatory evidence, is that of the occurrence of abortive cases. The Alberta and Manitoba reports point out that many such cases occurred, and that they were probably a factor of importance in the spread of poliomyelitis. It is estimated that for every paralyzed case there occurred several abortive cases. This feature must be recognized not only by public health officials but by the practising and teaching branches of the profession.

It should be pointed out that the splendid opportunity for demonstrating the value of convalescent serum came through an united effort on the part of public health officials, the Research Committee of the University of Manitoba, the practising profession, and the public. Information was given to the public through the Press and their co-operation was requested. The Research Committee made an important contribution by supplying consultants equipped to make complete bedside diagnoses, to give treatments, follow the cases and judge the results. During the height of the epidemic, the collection, preparation, distribution and administration of serum was under the direction of the Committee. Public health officials, both provincial and civic, gave every assistance in the provision of facilities for observation of cases, in administrative control of cases and contacts, and also in necessary publicity work.

The present stand of the public health authorities, then, must be one of preparedness, not only to supply convalescent serum when and where it is needed, but to coordinate the efforts of the different bodies and to direct the investigation of both single cases and of epidemics, in order that the essential features in the epidemiology of poliomyelitis may be learned. This is the first step necessary for logical methods of control.



Preliminary Programme  
**Ontario Health Officers' Association**

**FIFTEENTH ANNUAL MEETING**

PARLIAMENT BUILDINGS

*SPEAKER'S RECEPTION ROOM 76*

**Toronto, June 4th, 5th and 6th, 1929**

DAYLIGHT SAVING TIME

**TUESDAY, JUNE 4th.**

9.00 a.m.—Registration.

10.00 a.m.—Urban Health Administration Symposium:—"The Preparation of a Budget and Its Satisfactory Apportionment for a City with a Full-Time Health Department"—Dr. Fred Adams, M.O.H., Essex Border Municipalities.

Discussion—Dr. W. L. Hutton, M.O.H., City of Brantford.

Dr. J. W. Fraser, M.O.H., City of Kitchener.

"Pasteurization and the Correction of Its Defects"—Major J. H. Laurie, M.C., B.V.Sc., Deputy Director, Division of Food Control, Department of Public Health, Toronto.

Discussion—Mr. W. H. Forster, President of the International Association of Milk Dealers, Hamilton, Ont.

Dr. J. H. Radford, M.O.H., City of Galt.

"Food Inspection, Examination of Restaurants and Examination of Food Handlers"—Dr. W. S. Downham, M.O.H., City of London.

Discussion—Dr. James Roberts, M.O.H., City of Hamilton.

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2.30 p.m.—Address of Welcome—Honourable Dr. Forbes Godfrey, Minister of Health and Labour.

2.45 p.m.—President's Address—Dr. W. E. George, D.O.H., North Bay.

3.15 p.m.—"Major Diseases of Adult Life as a Problem of Preventive Medicine"—Dr. H. B. Anderson, Toronto.

**WEDNESDAY, JUNE 5th.**

9.30 a.m.—"Rural Sanitation"—Dr. A. E. Berry, Director, Division of Sanitary Engineering, Provincial Department of Health.

Discussion—Dr. C. A. Campbell, M.O.H., Kirkton.

10.30 a.m.—"Laboratory Specimens and Biological Products"—Dr. A. J. Slack, Director, Institute of Public Health, London.

Discussion—Dr. A. L. McNabb, Director of Laboratories, Department of Health, Ontario.

11.15 a.m.—“Some Problems of the Rural Medical Officer of Health”—  
Senator Dr. Gustave Lacasse, M.O.H., Tecumseh.

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2.00 p.m.—“The Department of Health and the Local Community”—Dr. J.  
J. Fraser, D.O.H., Guelph.  
Discussion—Dr. A. S. McCaig, M.O.H., Sault Ste. Marie.

2.30 p.m.—“The Relative Frequency of Tuberculosis of Bovine Origin in  
Europe and America”—James Miller, M.D., F.R.S.C., Kingston.  
Discussion—Dr. A. L. McKay, Epidemiologist, Ontario Dept. of  
Health.

3.00 p.m.—“Public Health Publicity.”  
Demonstration.

#### THURSDAY, JUNE 6th.

9.30 a.m.—Question Drawer.  
Morning will be devoted to discussion of questions relative to  
public health administration submitted by members of the  
Association.

#### EXHIBITS

A Public Health Exhibit will be a feature of the Meeting this year.  
Special emphasis will be placed upon services available to Medical Officers of  
Health.

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### COMING MEETINGS

MAY 28-31—ONTARIO MEDICAL ASSOCIATION, Hamilton, Ont.

MAY 29—CANADIAN TUBERCULOSIS ASSOCIATION, Hotel Wentworth Arms,  
Hamilton, Ont.

JUNE 3, 4, 5—ONTARIO HEALTH OFFICERS' ASSOCIATION, Toronto, Ont.

JUNE 18, 19, 20—CANADIAN PUBLIC HEALTH ASSOCIATION, Hotel Windsor,  
Montreal, Que.

JUNE 18-21—CANADIAN MEDICAL ASSOCIATION, Montreal, Que.

JUNE 21—CANADIAN SOCIAL HYGIENE COUNCIL, Montreal, Que.

JUNE 24-28—AMERICAN WATER WORKS ASSOCIATION CONVENTION,  
Toronto, Ont.

JULY 8-13—INTERNATIONAL COUNCIL OF NURSES, Montreal, Que.

# Preliminary Programme

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CANADIAN PUBLIC HEALTH ASSOCIATION  
18th Annual Meeting

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PUBLIC HEALTH SECTION CANADIAN MEDICAL  
ASSOCIATION

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CANADIAN SOCIAL HYGIENE COUNCIL  
10th Annual Meeting

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MONTREAL, June 18th, 19th, 20th, 21st, 1927

*Headquarters: THE WINDSOR HOTEL*

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*Executive Council, Canadian Public Health Association Meeting,  
Monday, June 17th, at 8.30 p.m., The Windsor Hotel.*

## FIRST SESSION

Tuesday, June 18, 1929, 9.30 a.m.—Windsor Hall

### Canadian Public Health Association

*Sanitary Officers*—Report of Committee on Training of Sanitary Officers—  
Chairman, Dr. A. J. Douglas, Medical Officer of Health, Winnipeg,  
Manitoba.

*The Present Status of Milk Control in Urban Centres*—Report of Committee on  
Milk Control—Chairman, R. H. Murray, C.E., Department of Public  
Health, Saskatchewan.

*The County as a Unit of Public Health Nursing*—Miss R. E. Hamilton, R.N.,  
Toronto, Director of Field Nursing, Canadian Red Cross Society.

*Some Aspects of the Mental Hygiene of Childhood*—Dr. Baruch Silverman,  
Assistant Director, The Mental Hygiene Committee of Montreal.

*The Control of Rabies in Canada*—Dr. George Hilton, Veterinary Director-  
General, Ottawa.

*Administrative Features of the Toxoid Campaign in Toronto*—Dr. F. S. Burke,  
Department of Public Health, Toronto.

*The Correction of Defects among Pre-School Children*—Dr. J. W. Fraser, Medical  
Officer of Health, Kitchener, Ontario.

**SECOND SESSION**

Tuesday, June 18, 1929, 2.30 p.m.—Windsor Hall

**Canadian Public Health Association**

Chairman—Hon. Dr. E. W. Montgomery, Minister of Health and Public Welfare, Manitoba

*Addresses of Welcome on Behalf of the Province of Quebec and the Corporation of the City of Montreal*

*Presidential Address*—Dr. Norman MacL. Harris, Chief, Laboratory of Hygiene, Department of Pensions and National Health, Ottawa

*Recent Progress in Studies of Acute Respiratory Diseases*—Dr. James A. Doull, School of Hygiene and Public Health, The Johns Hopkins University; Director, The John J. Abel Fund for Research on the Common Cold.

*A Retrospective Study of Public Health Progress in the Province of Quebec During the Last Twenty-Five Years*—Dr. Emile Nadeau, Assistant Director Provincial Bureau of Health, Quebec.

*Recent Contributions to the Knowledge of Vitamins*—Dr. Charles H. Best, Professor of Physiology, University of Toronto, and E. W. McHenry, M.A., School of Hygiene, University of Toronto.

**THIRD SESSION**

Wednesday, June 19, 1929, 9.15 a.m., Room —Ladies' Ordinary

**Public Health Section, Canadian Medical Association, and Canadian Public Health Association**

Annual Business Meeting and Election of Officers of the Section of Public Health, Canadian Medical Association.

*Observations on the Use of B.C.G. Vaccine in Montreal*—Dr. J. A. Baudouin, Professor of Hygiene, University of Montreal.

*Paper* (Title to be announced)—Dr. William Warwick, District Medical Officer of Health, St. John, N.B.

*Regulations for the Control of the Minor Communicable Diseases*—Report of the Committee—Chairman, Dr. Fred. Adams, Medical Officer of Health, Essex Border Municipalities, Ontario.

*The Use of Convalescent Serum in the Outbreak of Anterior Poliomyelitis in Winnipeg*—Dr. John M. McEachern, Medical Research Committee, Faculty of Medicine, University of Manitoba.

*Industrial Hygiene*—Dr. O. A. Cannon, The Steel Company of Canada, Hamilton, Ontario.

*Immunization Against Diphtheria in Montreal*—Dr. J. H. Gervais, Superintendent of the Division of Contagious Diseases, Department of Health, Montreal.

**FOURTH SESSION**

Thursday, June 20, 1929, 9.30 a.m., Room 129

**Public Health Section, Canadian Medical Association, and Canadian Public Health Association**

*Organization de la Division de l'Hygiène de l'Enfance*—Dr. Ad. Groulx, Superintendant de la Division de l'Hygiène de l'Enfance, Service de Santé, Montréal.

*Prophylaxie Générale de la Tuberculose*—Dr. R. P. Beaudry, Dispensaire Anti-Tuberculeux, Sherbrooke.

*L'Expérience de Trois Années à la Crèche d'Youville de Montréal*—Dr. Danie Longpré, Chef du Service des Nourrissons la Crèche d'Youville des Soeurs-Grises de Montréal.

*Les Unités Sanitaires de Comtés dans la Province de Québec*—Dr. L. R. Vézina, Unité Sanitaire du Comté de Terrebonne, Québec.

*La Pasteurisation du Lait*—Théodore-J. Lafrenière, I.C., Ingénieur-Sanitaire-en-Chef, Service Provincial d'Hygiène, Province de Québec.

**Laboratory Section, Canadian Public Health Association**

Thursday, June 20, 1929, 9.15 a.m., Room—Ladies' Ordinary

*Chairman's Address*—Dr. G. B. Reed, Queen's University.

*Bacteriological Analysis of Milk in Montreal*—Dr. A. Bolduc, Superintendent, Division of Laboratories, Department of Health, Montreal.

*Report of Committee on Methods for Active Immunization*—Chairman, Dr. D. T. Fraser, University of Toronto.

*Undulant Fever in Canada*—Report of Committee—Chairman, Dr. Chas. A. Mitchell, Health of Animals Branch, Department of Agriculture, Ottawa.

*The Incidence of Bovine Tuberculosis in Childhood*—Dr. R. M. Price, Department of Pathology and Bacteriology, University of Toronto

*Discussion*—Dr. R. I. Harris, Toronto.

*Leptospira Icterohaemorrhagiae*—Occurrence in Wild Rats in Toronto—Dr. Gordon C. Cameron and Dr. D. A. Irwin, Department of Pathology and Bacteriology, University of Toronto.

*The Influence of Oxidized and Reduced B. Welchii Toxin in the Production of Anaemia*—Dr. J. H. Orr, Dept. of Bacteriology, Queen's University.

*Mechanism of Oxidation—Reduction Potentials in Bacterial Cultures*—Dr. E. M. Boyd, Department of Bacteriology, Queen's University

*Bacteriological Findings in Recovered Cases of Typhoid Fever*—M. M. Johnston, M.A., and Dr. D. W. Cameron, School of Hygiene and Connaught Laboratories, University of Toronto.

**FIFTH SESSION**

Thursday, June 20, 1929, 12.00 noon, Room—Ladies' Ordinary

**Canadian Public Health Association**

*Annual Business Meeting, Canadian Public Health Association*

*Recommendations of the Executive Council*

*Report of the Nominating and Resolution Committee*

*Report of the General Secretary*

*Report of the Editorial Board*

*Report of the Treasurer*

**SIXTH SESSION**

Thursday, June 20, 1929, 2.30 p.m., Room—Ladies' Ordinary

**Section of Public Health Nursing, Canadian Public Health Association**

*Chairman's Address*—Miss Edith B. Hurley, Professor of Public Health Nursing, Université de Montréal.

*The Problem of Securing Recruits for the Public Health Nursing Field*—Miss Elizabeth L. Smellie, Ottawa, Chief Superintendent, Victorian Order of Nurses for Canada.

*Les Infirmières de la Division de l'Hygiène de l'Enfance du Service de Santé de Montréal*—Mlle. Marie Roy, Surveillante des Infirmières de la Division de l'Hygiène de l'Enfance, Service de Santé de Montréal.

*Some Aspects of Industrial Nursing*—Miss M. Dorothea MacDermot, Industrial Nurse in Charge of Health Department of the National Breweries, Limited, Montreal.

Discussion led by Mlle. Blanche Lecompte, Infirmière en Chef de la Brasserie Frontenac, Montréal.

**SEVENTH SESSION**

Thursday, June 20, 1929, 7.00 p.m.

Dinner Meeting, Province of Quebec Industrial Physicians' Association and Section of Industrial Hygiene, Canadian Public Health Association.



**EIGHTH SESSION**

Friday, June 21, 1929, 9.30 a.m., Room—Ladies' Ordinary

**Public Health Section, Canadian Medical Association, and  
Canadian Social Hygiene Council**

*Communicable Disease in Canada and the Need for Public Education*—Dr. A. Grant Fleming, Director, Department of Public Health and Preventive Medicine, McGill University.

*Some Problems in Medical Organization Having to do with the Control of Preventable Illness*—Dr. J. H. Holbrook, Superintendent, Mountain Sanatorium, Hamilton, Ontario.

*The Progress of Venereal Disease Control in Canada*—Dr. Gordon Bates General Secretary, Canadian Social Hygiene Council, Toronto.

**NINTH SESSION**

Friday, June 21, 1929, 2.30 p.m., Room—Ladies' Ordinary

**Canadian Social Hygiene Council**

Annual Meeting of Canadian Social Hygiene Council.

1. *Presidential Address.*

2. *Report of the General Secretary.*

3. *Reports of Standing Committees:*

1. Venereal diseases.
2. Narcotics.
3. Smallpox, diphtheria and communicable diseases.
4. Periodic health examination and medical examination before marriage.
5. County health units.
6. Publicity & health education.
7. Legislation.
8. Constitution and by-laws.
9. Organization.
10. Finance.

4. *General Discussion.*

5. *Election of Officers.*

# EPIDEMIOLOGY AND VITAL STATISTICS

A. C. JOST, M.D., AND NEIL E. MCKINNON, M.B.

## WATER-BORNE OUTBREAK OF TYPHOID FEVER AT KAPUSKASING, ONTARIO

Reports from various provinces indicate that typhoid fever incidence will probably be higher this year. Every outbreak now means more active carriers of the disease for the future, and therefore, more sources for future infection. Already two rather extensive water-borne epidemics have occurred in Ontario. One of these—that at Kapuskasing—is dealt with below by Dr. A. L. McKay, Epidemiologist, Department of Health, Ontario.

This short report serves to point out what may be expected often when water from a questionable source is used. It indicates, too, that the provincial authorities stand ready and equipped to combat an epidemic, to locate, and if possible, eliminate the source, or to prevent, in the future, a similar transmission of infection. The necessity for the immediate notification of every case of typhoid fever is well demonstrated by every epidemic that occurs—because the first case was not reported. Dr. McKay's report follows:

As a result of receiving six blood specimens from Kapuskasing at the main laboratories of the Department of Health of Ontario during the latter part of March and the first week in April, and four of these having proven to be "positive", and also due to rumours to the effect that there were other cases not yet reported, the epidemiologist and sanitary engineer

of the Province went to Kapuskasing, arriving there on April 10th.

Kapuskasing is a town of about 3,400 population, situated on the transcontinental line of the Canadian National Railway, about 50 miles west of Cochrane. One large industry, that of a power and paper company, supplies work for practically the whole industrial population. The water supply of the town, supplied by this company, is filtered and chlorinated and has always been of excellent quality, the operation of the water works plant being a model one. The milk supply is obtained from seven raw milk dealers.

Upon investigation in co-operation with the medical officer of health, it was found that all cases were situated outside of the town limits, and were not provided with town water or sewers. In all, twenty-eight cases were discovered, an analysis of which was as follows:

Sex—Male —14

Female—14

Age— 0-10 yrs.—12

11-20 " — 8

21-30 " — 5

31 " — 3

Dates of onset ranged from February 26th to April 2nd.

The regular questionnaire form was used in investigating each case, and it was found that the only common factor as a possible source of infection to these cases was the drinking water.

Ordinarily the drinking water was taken from dug wells. These wells were unprotected at the top, but no previous cases had been reported from the drinking of this water. During the early part of February the wells had run dry, and the settlers had used water from a nearby creek. This water had ample opportunities for pollution. Outdoor surface privies were in close proximity to this creek, and rains or thaws would allow the contents of the privies to be washed into the creek at will. Undoubtedly

this polluted creek water was the source of infection.

The medical officer had inoculated all the family contacts in the homes where cases had occurred. Every house in this area had been warned to boil the water. The wells which had run dry were now in use.

This epidemic again exemplifies the danger to inhabitants of a neighborhood in which proper rural sanitation is not insisted upon, and also the danger of drinking any water from an unprotected source.

*A. L. McKay.*

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA\*  
BY PROVINCES—MARCH 1929

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria....	22	16	186	261	50	39	48	51
Scarlet Fever..	99	77	577	646	92	157	206	43
Measles.....	42	12	584	4554	1507	191	310	235
Whooping Cough.....	11	—	62	466	143	29	6	17
German Measles.....	3	—	53	22	†	10	19	2
Mumps.....	—	—	131	708	268	131	81	478
Smallpox.....	—	3	16	69	17	51	11	81
Cerebrospinal Meningitis..	3	1	3	11	1	—	5	3
Anterior Poliomyelitis	—	—	—	—	—	—	—	2
Typhoid Fever	1	7	50	30	9	2	18	3

\*Data furnished by the Dominion Bureau of Statistics, Ottawa.

†Not reportable.

## PUBLIC HEALTH NURSING

RUBY M. SIMPSON, REG.N., AND FLORENCE H. M. EMORY, REG.N.

### OCCUPATIONAL THERAPY IN A PUBLIC HEALTH NURSING ORGANIZATION

GENEVIEVE L. HUND

Executive Secretary, Montreal Branch, Victorian Order of Nurses

The Montreal Branch of the Victorian Order of Nurses has been the first organization in Canada to take occupational therapy into the homes of its patients. Such work came into being three years ago as the result of requests on the part of staff nurses for some sort of occupation for con-

valescent and chronic patients, who lay in bed day after day with no outlet for expression, the four walls of their rooms often the only horizon they had seen in many months. Since soul weariness is reflected in retarded progress towards recovery, occupa-

tional therapy, or invalid occupation as it is sometimes called, may be pressed into service with advantage. Occupational therapy is not a cure in itself; it acts principally as a mental stimulus, it conserves in some degree what is left to the patient of healthy functioning, it substitutes useful, purposeful graded activity for harmful and indefinite exertion and restlessness. It is used as a means of encouraging rest of body and mind, and recovery may be favourably influenced by work intelligently directed and encouraged by a personal understanding, an optimistic spirit and a broad, helpful point of view. The occupational therapist must have good therapeutic sense, the teaching instinct, a good mental balance, and personality. In working with home-bound patients, she must take into consideration the family problem, if such exists, distractions incident to home life, and she must co-operate with the nurses and doctors and correlate her treatment with theirs.

This department of the Victorian Order of Nurses originally operated entirely with volunteer workers, but for the past two years a therapist has been responsible for the conduct of the work. She visits all cases, prepares work for the patients, arranges for the sale of finished articles, and keeps contact with other organizations which may be interested in the particular cases. Three volunteer workers assist her—an invaluable help, for without them it would be impossible to care adequately for the thirty-four patients now on the roll, as the area covered in Montreal is tremendous, and distances between cases very great.

All cases are referred to the Occu-

pational Therapy Department by the nurses, after consultation with the attending physicians as to whether or not occupational therapy would benefit the patient. The therapist then visits the patient, takes samples of raffia craft work in which the department specializes, and establishes a contact with the family and patient which is the first step in successful rehabilitation work. It is the rule rather than the exception that immediately the patient sees the bright coloured raffia strands and examines the lovely bags and purses which have been made by people as handicapped and ill as he, his interest is caught, and he is eager to try the work himself. His first finished article, the product of his own creation, unconsciously changes his mental outlook. He is competing with other workers in the world again. He is no longer entirely a dependent. Frequent consultations with nurses visiting the case, and in special cases with the nursing superintendent, assure that the patient will not suffer from over-work or strain.

The marketing of products has proved no difficulty, as the work is recognized as being of a high standard by the Canadian Handicraft Guild, and its shop, as well as the Hwaiking Mission Shops, disposes of all articles, no commission being asked for this service. The cost of materials plus a small percentage to cover transportation costs is deducted from the selling price, and the net profit given to the patient. Thus, except for the therapist's salary, the department finances itself.

Patients run the gamut of human illnesses, from the thirteen year old girl who is a severe cardiac case, to the eighty year old Norwegian sea-cap-

tain, who has been paralyzed for nineteen years, all that time under the care of the Victorian Order of Nurses. In one home we have two brothers-in-law, one a paralytic and one a rheumatic, both keenly interested in the creation of raffia purses, smoking contentedly and discussing the relative merits of the patterns and colours provided. In the same district we have a woman of "over seventy" as she says, both legs amputated for a diabetic condition, tired of doing the mending for four grandchildren; but happy and interested in making tea-cosies for American tourists! A Newfoundland fisherman, who for many years has mended fishing nets on the Newfoundland banks, excels in weaving beautiful raffia mats. He has a tuberculous bone condition, and was becoming very depressed and morose when the therapist discovered him. Now he can sink his worries in the work of his hands, and is making a regular small income besides. Another Newfoundlander, this time a woman, one leg amputated and the other in a plaster cast, told us that the raffia was the first colour that had ever been brought into her life, drab grays and half-tones of black made up the environment and atmosphere of her girlhood home. Now vivid reds,

magentas, yellows and greens are fashioned by her into such glories as she never dreamed existed! Not all patients can do raffia work, of course, and for them the therapist's ingenuity is taxed to the utmost, for to make an article simply for the sake of production is wasted effort. Standards worthy of entirely normal persons must be maintained for proper mental stimulation, and so the market is studied even for the articles made by these patients, and a demand for hot-water bottle covers will tide over a lean period, as will an order for golf hose, or wool reins for children's gifts.

There is abundant need for occupation even for those whose cure it does not help. For patients whose recovery is not expected, for many chronic sufferers, work, and the sight of beauty, are as needful as food and sleep. For work and beauty are a large part of what makes life worth living—to make something useful or beautiful, and at the end of a day or a week to see what we have accomplished is to be alive, and in some encouraging degree successful, no matter what the results of illness. Just as the greatest values in life are intangible, so it is impossible to put into words what occupational therapy can mean to the home-bound and the hopeless.

## FOOD AND DRUGS

H. M. LANCASTER, B.A.Sc., AND A. R. B. RICHMOND, B.V.Sc.

### REGULATIONS FOR FOOD HANDLERS

From time to time the subject of putting into effect regulations governing food handlers is raised in various parts of the country, and the follow-

ing draft, issued by the New York State Department of Health to municipalities seeking advice on the matter, is of interest in this connection:—

1. The term "proprietor" as used in this section shall apply to any individ-

ual, association, firm, or corporation engaged in the business of providing food to be used for human consumption.

2. No proprietor shall employ in the handling of food which is to be used without subsequent cooking, a person known to be harbouring the germs of typhoid fever or other disease which may be communicated through food.

3. All persons who handle food to be used without subsequent cooking, shall submit to such physical examination or furnish such specimens of bodily discharges for laboratory examination as the health officer may require for the purpose of determining freedom from the germs of communicable disease. No proprietor shall continue to employ in the handling of such food any person who refuses to submit to such examination or furnish such specimens.

4. Adequate facilities for washing the hands shall be located convenient to every toilet in every establishment handling food for human consumption. In every such toilet there shall be posted conspicuously an easily legible sign which shall read as follows: "Wash your hands with soap and water immediately after using the toilet."

#### CONDUCTING THE METHYLENE BLUE TEST AT 145° F.

The following is the summary of a paper upon the suggested application of the methylene blue reductase test in determining the presence of thermophiles in raw milk, read by Dr. H. A. Harding before the International Association of Dairy and Milk Inspectors in convention October 1928:

During the past six years there has

been a growing appreciation of the large number of thermophilic bacteria occasionally present in pasteurized milk.

The available methods of determining their presence have given erratic results, and it is commonly believed that outbreaks of thermophiles in pasteurizing plants occur at irregular and widely separated intervals.

By the use of the methylene blue reductase test at a temperature of 145° F., it has been found that thermophiles were present in all pasteurized milk which has been tested. At least in the larger plants the number of thermophilic bacteria in the pasteurized product tends to increase with the length of the pasteurizing operation. In plants which operate five or more hours there is commonly, in the milk pasteurized last, more than a million per cubic centimeter of these interesting and harmless thermophilic bacteria.

To date little or no progress has been made in determining the sources from which the thermophilic bacteria enter the raw milk because of the lack of a technic by means of which their presence in raw milk could be recognized conveniently.

Tests by the methylene blue reductase test at 145° F. have uniformly shown the presence of thermophilic bacteria in raw milk as it reaches the milk plant, and the reduction time varied from 40 minutes to 11½ hours. This test has not yet been applied to the study of the relative abundance of thermophilic bacteria in milk at the various stages in its production and transportation.

It is believed that the methylene blue reductase test at 145° F. offers a practicable means of locating the



source or sources from which thermophilic bacteria find their way into the raw milk supply.

### OBESITY AS A PRECURSOR OF DIABETES

In a paper under this title in a recent copy of the *Journal of Nutrition*, Dr. S. Franklin Adams, discusses data collected at the Mayo Clinic. Previous investigations have concerned themselves largely with urban patients; the groups dealt with by Dr. Adams are largely rural districts.

Altogether 673 case histories were examined and figures for age, weight and height were critically studied. The amount of overweight was determined by comparison with actuarial tables.

From an analysis of these figures, it appears that 91 per cent of the patients were overweight and that 82.9 per cent were more than 10 per cent overweight before their diabetes began. As age increases to the fifth decade, the candidates for diabetes increase in weight. After the age of fifty, the percentage of overweight is slightly lower. Obesity may be an important factor in the development of diabetes in young persons, because more than 30 per cent of persons less than twenty years of age were more than 10 per cent overweight before their diabetes began.

Dr. Adams recognizes that there are two types of obesity, the first preventable and due to faulty habits of eating, the second unpreventable and due to heredity, previous diseases or disturbances of the endocrine glands. More than half of the group examined were obese for preventable reasons.

This is interesting because Joslin has pointed out that it is the excessive amount of the total food rather than

the amount of carbohydrate which does harm. The Japanese as a race consume a large amount of carbohydrate, but are not prone to diabetes. The consumption of food per capita is greater in the United States than in any other country and there is found an alarming increase of diabetes.

### PAPER MILK-CONTAINERS

THE Sheffield Farms Company, New York, began on January 8th, of this year, to distribute 50,000 quarts of milk a day in a cone-shaped container made of spruce fibre, paraffined, thus doing away with glass bottles. The same price is to be charged as for the glass bottle. The structure of this container, and the price to be charged will depend upon its acceptance by the public. Two major objections have been encountered in the past when milk containers other than glass have been tried. These objections were as follows:

1. The tremendous space necessary in a milk plant to store containers that could only be used a single time.
2. Unwillingness of the consumer to accept such a container, largely because a creamline was not visible.

The manufacturers of the present container feel that both these major objections have been overcome, and in addition some minor faults have been taken care of. The present container enables the housewife to see the creamline through the paper. The handling of the container hitherto presented a distinct problem. This is overcome now, and the space required in the delivery wagon is minimized. Delivery cartons of stiff paper each have spaces for 12 quart containers. The con-

tainer is opened by merely clipping off the top with scissors, and closed again, if all the contents are not used, by folding over the top. The milk cannot drop down the sides after pouring from the package.

The container is for single use only, and is thrown away by the customer after the milk has been used. Thus, there is no collecting of empty bottles, nor is there any loss from broken or stolen bottles.

The washing operations in the plant

are thus materially reduced. The corrugated package holding the containers is good for four or five trips. Twenty-four quarts of milk in these containers are packed in the space needed for six quart glass bottles. Sheffield Farms will make, sterilize, fill and seal the containers in its own plant in a single operation.

The article does not give any detailed cost of the paper container.—Dairy Products Merchandising, Jan., 1929.

## SOCIAL HYGIENE

A. M. DAVIDSON, M.D., AND G. P. JACKSON, M.B., D.P.H.

### A COURSE OF POPULAR LECTURES ON HEALTH TOPICS

AN interesting experiment in general health education has been carried on during the last few months in Toronto by the Canadian Social Hygiene Council.

It was considered that the time was opportune for the development of a series of popular lectures. With this end in view arrangements were completed for the procuring of speakers and efforts were made to attract attention in the usual way. The results have eminently justified the anticipations of the sponsors of the scheme.

Commencing with a lecture on "Why Public Health?" by Dr. George Bigelow of Boston, Health Commissioner for the State of Massachusetts, a brilliant and convincing address was delivered before a large audience in the Tivoli Theatre. The next lecture was delivered at Hygeia House, the headquarters of the Canadian Social Hygiene Council, by Dr. A. Grant Fleming of Montreal on "The Conquest of Disease". Succeeding addresses were given at Hygeia House by Dr. Harry S. Thomson, General

Secretary of the Canadian Dental Hygiene Council, on "Your Teeth and Your Health"; Professor Martin Fischer, Professor of Physiology in the University of Cincinnati, on "Heredity"; Colonel L. W. Harrison, Medical Advisor to the Ministry of Health of Great Britain, on "Venereal Diseases", and Dr. Joseph C. Bloodgood, Professor of Surgery, Johns Hopkins University, Baltimore, Md., on "How to Teach Children and Grown-ups to Protect Themselves against Cancer".

Towards the end of the series the attendance showed a marked increase and although the seating capacity of the Auditorium at Hygeia House is 1,500, on the occasion of the last two lectures hundreds of people were turned away.

The committee in charge went to a good deal of trouble to make the lectures interesting. The lectures were of a high order. Moving pictures or lantern slides were used on all occasions and music was also a feature. On several occasions cash prizes were

presented by various prominent citizens for the best essays written by persons in the audience. Judges qualified to give expert opinions on the matters discussed in the essays were appointed in each case. The numerous essays sent in provided concrete evidence both of the interest of the audience and the value of these meetings in stimulating interest and attendance. The meetings were advertised by announcement in churches and over the radio, as well as by the procuring of advertising at usual press rates, and efforts were made to obtain the interest and support of employers of labor, life insurance companies and various organizations in the city. The meetings were held on Sunday nights after church, an arrangement made partly to avoid conflict with the theatres which would provide direct opposition on week nights, and to avoid conflict with church services.

While the Canadian Social Hygiene Council has arranged similar meetings in other parts of Canada from

time to time, this is the first time that so elaborate a series has been staged. The experiment has been so successful that preparations are now under way for a more elaborate series next season.

#### ANNUAL MEETING CANADIAN SOCIAL HYGIENE COUNCIL

**T**HE Annual Meeting of the Canadian Social Hygiene Council will be held in Montreal on Friday, June 21st. The Annual Meeting this year is being held in co-operation with the Canadian Medical Association. The morning session will be devoted to the discussion of papers and in the afternoon the Standing Committees of the Council will report progress and the general business session will be held.

This year a number of other national organizations have been asked to appoint representatives to the General Council of the organization, and it is hoped that the representatives from a number of these organizations will be present.

## NATIONAL VOLUNTARY HEALTH AGENCIES

RUBY E. HAMILTON, Reg.N.

#### BED ACCOMMODATION FOR TUBERCULOSIS PATIENTS

The Canadian Tuberculosis Association make the following announcement in connection with bed accommodation for tuberculous patients:

Sanatorium construction is endeavouring to catch up to the remarkable demand for institutional treatment of tuberculosis brought about mainly by increased diagnostic facilities. Following the pioneer efforts of this Asso-

ciation, travelling chest diagnosticians are now operating in every province of Canada, and many diagnosticians from the different sanatoria are giving assistance to the local doctors and their patients.

During the past twelve months, a hundred additional beds have been completed at Tranquille, B.C., the erection of one hundred and twenty-

five beds has been started at Prince Albert, Saskatchewan, and the Speech from the Throne in Manitoba announced the provision of a new sanatorium there of probably two hundred and fifty beds. In Ontario, Essex County has completed sixty new beds, London seventy-five new beds, Brantford twenty-five new beds; the Niagara Peninsula announces the erection of one hundred beds for this year; Freeport Sanatorium, Kitchener, announces seventy-five new beds and Hamilton has just had occupied eighty new beds, the Southam Memorial gift. Ottawa is planning to complete twenty-six new beds, and the Eastern Ontario Counties are negotiating with the Provincial Government for accommodation of one hundred beds. Premier Ferguson, however, announced in the Ontario Legislature in the week of Feb. 18th, that his government would appoint a commission to make an exhaustive inquiry into the whole problem of hospital assistance and administration, and declined to consider the passing of any legislation this session bearing on these matters. This has the effect of holding up the construction in Ontario of 250 sanatorium beds this year, for the treatment

of tuberculosis, but greater assistance is expected after due study and report. Quebec Province has announced a one hundred bed addition to the Lake Edward Sanatorium, one hundred beds to the Laval Hospital, Quebec, one hundred beds at Three Rivers, and four hundred or more at Montreal, thus making a total of nine hundred additional beds in this province. In New Brunswick a thirty-bed addition is planned at Saint John, and one hundred beds favoured by the Government for the northern part of the Province. In Prince Edward Island, it looks encouraging for the erection of thirty-five beds, and Alberta has acknowledged a provincial shortage of beds for the tuberculous.

These developments still leave us very considerably short of one bed per death each year in Canada from tuberculosis, but assure us of more than 7,300 beds, well managed and supervised by efficient medical staffs. At the close of 1927, when the last directory of Canadian Agencies for the Diagnosis and Treatment of Tuberculosis was assembled, there were reported to be 4,801 beds for adults and 692 for children, in the eight provinces in which sanatoria were operating.

## NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

### NATIONAL SICKNESS AND INVALIDITY INSURANCE

In his evidence before the Select Standing Committee on Industrial and International Relations, Dr. J. G. FitzGerald, Professor of Hygiene and Preventive Medicine in the University of Toronto, gave some very interest-

ing information, two salient features of which follow. Professor FitzGerald quoted an estimate recently compiled by Dr. J. W. S. McCullough of the Department of Health, Ontario, on the Cost of Sickness in Canada, which shows the annual cost of illness alone to be \$311,060,448. This

estimation is based upon some work done in the United States by Homer Folks, LL.D., and presented before the International Conference of Social Work in Paris in 1928 under the title "The Distribution of the Costs of Sickness in the United States". The total cost of illness is made up of two items, namely, the cost accruing up to the period of recovery or death of each person who is ill, amounting to the figure stated above; and a second item which is hypothetical, obtained by an estimation of the net future earning power of those who have died, amounting to \$1,000,000,000, a grand total of \$1,311,060,448. Of the 311 millions expended on illness, 11 per cent is paid by provincial and municipal authorities under various heads in the support of hospitals, indigents and public health work; the remaining 89 per cent falls upon the individuals, themselves ill or supporting the invalids. It was Professor FitzGerald's opinion that a complete survey of conditions should be made in Canada to ascertain whether adequate and sufficient medical service (preventive and curative) is available to meet the needs of all, and whether the present economic loss can be lessened by a reduction in preventable sickness. Upon the ascertainment of these facts it will be possible to correlate the needs of Canada to measures for the control of sickness and invalidity practised elsewhere, and thereupon recommendations may be forwarded to the responsible authorities interested in a national scheme of insurance against sickness and invalidity.

CLEMENS PIRQUET, M.D.

THE tragic death of Freiherr Clemens Pirquet in Vienna is to

be noted with regret in the medical world at large. Von Pirquet was born in Vienna in 1874, educated at Kalksburg, and the Universities of Vienna and Graz, from the latter of which he obtained the M.D. in 1900. In 1908 he became professor of paediatrics at the Johns Hopkins University. Returning to Europe in 1910, he distinguished himself first at Breslau and later at the University of Vienna in which he occupied the Chair in Paediatrics. Probably the cutaneous tuberculin reaction that bears his name is more widely known to the profession, but his contributions to paediatrics are of an even greater value, particularly his studies on the nutrition of children. Following the war and its disastrous effect on the children of Austria, Pirquet, who then dropped the "von" in his name, further distinguished himself in the administration of relief. Dr. Pirquet visited America last year and had returned but a comparatively short time to his famous clinic in Vienna, when his sudden death as well as that of his wife, was announced.

#### Nova Scotia

THE Nova Scotia Hospital Association organized at Truro, March 14th, 1929, has approached the Provincial Government with reference to the increasing of aid in the maintenance of local hospitals.

It is expected that the new Highland View Hospital at Amherst will be opened for the reception of patients in June next. It will be remembered that this hospital was totally destroyed by fire in May of last year.

Plans are under preparation for the extension of Payzant Memorial Hos-

pital at Windsor and the Inverness Memorial Hospital at Inverness, C.B.

The counties of Yarmouth, Pictou, and Cape Breton have applied to the Legislature for authority to borrow money to erect annexes to their several hospitals for the purpose of treating and caring for tuberculous patients. This application is due largely to the activities of the Nova Scotia Tuberculosis Commission which, amongst other features of its platform, strongly advocates "more hospital beds for the care of the tuberculous."

#### New Brunswick

EARLY steps were taken during the month of March towards the establishment of a Family Welfare Bureau as one of the divisions of the newly organized Central Welfare Council in the city of Saint John. The services of Miss Elizabeth King were loaned to the local council by the Canadian Council on Child Welfare for the purpose of organizing the Family Welfare Bureau under the chairman, Dr. H. L. Abramson, Director of the Bureau of Laboratories, Department of Health.

Further to the diphtheria prevention campaign in St. John, commenced in March and noted in the previous issue of this Journal, the campaign has the active assistance of the local practising physicians and has met with a most encouraging response from the public. In the first stage of the campaign over 1,000 children were found to have been previously immunized with toxoid, and these, included with the 7,550 children who received their first inoculation, make a total of

80 per cent of the pupils enrolled in the schools. Amongst those receiving their first inoculation were 1,360 children of pre-school age.

#### Ontario

ACCORDING to a return tabled before the House of Commons recently, the Dominion Government in 5 years has paid \$1,328,546 compensation for tuberculous animals destroyed in Ontario under the Contagious Diseases in Animals Act. Of the foregoing, \$387,991.16 was paid for grade cattle, an average of \$34.47 per head, and \$940,555.44 was paid for pure bred animals, an average of \$79.65 per head. Glanders in Ontario cost the Government \$100.00 and hog cholera cost \$15,262. Salaries and travelling expenses incident to the administration of the above Act by the Department of Agriculture amounted in the past five years to \$1,937,548, of which \$632,267 was expended as a result of diseases of animals in the Province of Ontario.

The American College of Surgeons has classified the Isolation Hospital, Department of Health, Toronto, as A-1 in their cadre of isolation hospitals. Dr. B. Hannah is the physician-in-chief to this institution and Miss K. Matheson the superintendent of nurses.

The section of School Health and Physical Education of the Ontario Educational Association, held its annual session in Victoria College, University of Toronto, April 2nd and 3rd last. Two subjects of special interest to school physicians were presented: "Hardness of Hearing" by Dr. Howard McCart with discussion led



by Dr. D. C. Bastow; and a symposium on "Speech Defects", led by Dr. L. A. Pequegnat, Professor E. D. MacPhee and Miss Elizabeth Bowling.

The following officers were elected to this section of the Association for the ensuing year: Hon. President, Dr. J. T. Phair; President, Dr. J. C. Sivett; First Vice-President, Dr. L. O'Connor; Secretary-Treasurer, Miss Barbara A. Ross; with the following Executive: Dr. McAlpine, Dr. Reid, Miss Pegg, Miss Archer, Miss E. deV. Clarke, Miss J. McEwen.

The Ontario Division of the Red Cross Society has provided in its budget for 1929 a sum of \$15,000 for the establishment of three new out-post hospitals at Redbridge, Kakabeka Falls, and Emo, in the northern part of the Province, as part of its already large programme providing medical care for the sparsely settled areas.

Miss Annie J. Hartley, recently appointed matron-in-chief of the hospitals under the Department of Pensions and National Health, was the guest of honour at a banquet given by the Overseas Nurses' Club in conjunction with the Registered Nurses' Association of Ontario to mark the occasion of her important appointment.

#### Manitoba

THE annual budget placed before the Provincial Legislature on April 4th provided \$2,287,242.13 for the Department of Health and Public Welfare. Of this, \$190,440 is to be devoted to public health expenditure, exclusive of the expenses to be incurred under administration by the Minister and Chief Executive and also

exclusive of hospital aid of any kind. Previous to May 1928, provincial public health expenditure in Manitoba was on the basis of approximately 17 cents per capita (exclusive of the expenditures of the Department of Health of the City of Winnipeg). This year the budget provides for such expenditure on the basis of 29 cents per capita.

The Government is providing in the present budget for increased accommodation for those afflicted with chronic mental conditions and also for tuberculosis patients.

#### Saskatchewan

DR. S. R. D. HEWITT, who was for seven years the Medical Director of the Toronto Area of the D.S.C.R., has been appointed Superintendent of the Regina General Hospital.

#### British Columbia

THE B.C. "Miller Bill", based upon the economic aspects of the Report of the Milk Inquiry Commission, which sat for about seven months, was passed by the Legislature on March 20th, 1929. Many points in the Report, especially those relating to the public health and legal aspects, remain to be implemented by later legislation. It is announced that the Report will be published by the Provincial Government.

Preliminary steps have been taken by the councils and school boards of the three North Shore municipalities including North Vancouver to form a full-time health unit for the combined area. Dr. Harold Dyer was appointed to compile a report showing the relative costs of the existing system as compared with that of the proposed health unit.

## BOOK REVIEWS

D. T. FRASER, B.A., M.B., D.P.H. and R. R. McCLENAHAN, B.A., M.B., D.P.H.

**Tuberculosis and How to Combat it.**—By Francis M. Pottenger. C. V. Mosby Company, Publishers, St. Louis, Mo., 1928, pp. 275. \$2.00. McAinsh & Co. Ltd., Toronto, Canadian Distributors.

This work is the answer to most of the questions which are asked by a patient on being told that he has tuberculosis. And what a problem confronts one when faced with this diagnosis! This book outlines in lay terms what it all means and certainly radiates optimism. In the early chapters tuberculosis is described, pointing out its infectious character, followed by an outline of the susceptibility of the human individual and the usual sources of infection.

Considerable attention is given to childhood infection, pointing out the danger of bovine infection from the milk supply and pasteurization as a means of combating this danger.

The author feels that adult disease is most commonly but an activation of a childhood infection.

Since there is no specific cure for tuberculosis, the merits of the various means employed in treatment are described, such as open air, rest, food, baths, etc., and by one who has a great wealth of knowledge of the values to be ascribed to these.

This book in no way supplants the physician, but should be a very useful adjunct in readjusting the patient to his new environment and outlook on life.

It is a book to be highly recommended for the patient and his friends.

M. H. Brown.

**Nutrition and Diet in Health and Disease.**—By James S. McLester, M. D., Professor of Medicine at the University of Alabama, Birmingham, Alabama. 783 pages. \$9.00. London and Philadelphia: W. B. Saunders Company, 1928. Canadian Agents: McAinsh and Company, Limited, Toronto.

This book has been written avowedly from the point of view of the physician whose interests are general. To the reviewer it seems likely that it should have considerable interest for physicians, but also for dietitians, particularly in hospitals. This is true, because, throughout the book, there is not only a concise treatment of the subject theoretically but many practical applications are suggested.

Approximately one-third of the volume deals with nutrition in health and this is divided into three sections; A. The Need for Food and Its Utilization; B. Food Products; C. Diet in Health. In each section the subject matter is presented in concise form and the author makes abundant use of standard authorities; everything is entirely orthodox and based on good evidence. On considering the normal diet, emphasis is placed upon the economics of food-buying. In section C. is included a chapter on Infant Feeding by Dr. McKim Marriott of St. Louis.

The balance of the book, the major portion, is given over to a consideration of nutrition in disease, and it, too, is divided into three sections: A. Diseases in which Diet is of Para-

mount Importance; B. Diseases in which Diet is of Varying Importance; and C. Tables and charts of a General Nature.

In Section A. are treated the deficiency diseases (rickets, pellagra, etc), diabetes mellitus, gout, obesity and leanness, anaphylaxis, diseases of the kidney and urinary tract, and diseases of the digestive organs. Section B considers the treatment of febrile diseases, diseases of the heart and arteries, of the blood, of the joints, of the nervous system, and diseases related to the function of the endocrine organs. For each disease there is a general consideration of the pathology, and then a discussion of the diet as recommended. Detailed diets are given. The treatment throughout is conservative.

The last section contains a useful collection of tables and charts, which should prove valuable for reference purposes. While these are not new, and are all taken from standard text books on nutrition, the placing of them in the volume brings tables together from various sources. For instance, here we find tables by Harris and Benedict for correction values in metabolism determinations, and tables by Sherman on food composition.

The book can be recommended as sound and practical.

*E. W. McHenry.*

**Pediatrics for the General Practitioner.** By Harry Munroe McClanahan, A.M., M.D., Professor of Pediatrics, Emeritus, University of Nebraska, Member of the American Pediatric Society, Ex-President

of the Nebraska State Medical Association. J. B. Lippincott Company, 201 Unity Bldg., Montreal. 610 pp. Price \$7.00.

Dr. McClanahan in his preface, outlines the motive for yet another book devoted to the diseases of infancy and childhood. He tells us that he is desirous of presenting a text that will be of service to the general practitioner, avoiding the inclusion of details of physiology, pathology and laboratory technique, when such can be safely dispensed with. Dr. McClanahan has accomplished his objective with a fair measure of success. Much of the material in the book is the result of the author's personal experience, experience accumulated both as a general practitioner and as a pediatrician. The inclusion of the experience of his colleagues, either on the university or hospital staff, might have added something in certain instances.

The illustrations, and, too, bibliographies at the conclusion of each chapter, are excellent and numerous. The suggestions regarding management and habit training are extremely practical. The chapter dealing with the normal infant is a valuable addition to the subject. The author has in some cases sacrificed completeness of detail for brevity; particularly is this true in the chapters dealing with communicable diseases and miscellaneous diseases. Additional treatment suggestions might have been of value, but on the whole, the book will be a useful addition to the library of the physician in general practice.

*J. T. Phair.*

## CURRENT HEALTH LITERATURE

D. T. FRASER, B.A., M.B., D.P.H.,

**To what extent do Toxin-Antitoxin mixtures sensitize to therapeutic Serum?** — The author reviewed the literature concerning reactions in human beings to the injection of antitoxic sera (horse serum). A greater proportion of persons appears to react to therapeutic injections of serum following toxin-antitoxin injections than of those who had previously received a dose of antitoxin and also of those who had not previously had antitoxin. The results are based on two years' experience. If toxin-antitoxin mixtures prepared with horse antitoxin sensitize an appreciable number of persons, and in the event of subsequent serum therapy lead to a severe type of serum sickness, revision of present methods of active immunization against diphtheria should be instituted. Two alternate methods are available, substitution of goat antitoxin for horse antitoxin in preparing toxin-antitoxin mixtures, or the use of toxoid (anatoxine of Ramon).

GORDON and CRESWELL, *Jour. Preventive Med.*, Vol. III, No. 1.

**Ergosterol and Cathode Rays.** Current Comment. *J.A.M.A.*, Vol. 92, March 9, 1929.

One of the most recent and dramatic discoveries of medicine is that a constituent of certain plant products and of yeast, ergosterol, though of itself apparently inert, acquires extraordinary biologic potencies through exposure to ultraviolet rays. This substance when irradiated becomes powerfully anti-rachitic. Apparently such an astoundingly minute amount as one ten thousandth of a milligram administered daily to a rat, fed on a diet known to produce rickets, will cure or prevent rickets. This amount is of the order of magnitude of one

part in fifty millions of the daily ration. Indeed because of the efficiency of radiation, it is fair to assume that the anti-rachitically potent material need not be more than one part or less per billion of ration in order to be effective. Cathode rays operating at about two hundred volts are not as effective as ultraviolet rays in activating ergosterol. There is evidence that such rays do not activate ergosterol by virtue of ultraviolet radiation produced by the rays themselves.

**Report on Swabs from the Throat and Nasal Passages**—The author in

his review of the interpretation of laboratory findings in suspected diphtheria, reiterates certain well established principles. Special emphasis is again laid upon the warning, "the practice of withholding antitoxin until the report on the swab has been obtained cannot be too strongly condemned". In cases where there is a reasonable suspicion of diphtheria it is the duty of the physician to administer antitoxin at once. A laboratory report is, of course, only an aid to diagnosis. A practical suggestion is made that, particularly in the case of suspected carriers, the culture be re-examined after a second 24 hours' incubation. By this procedure the percentage of positive findings may be increased as much as 50 per cent. Three negative reports are not sufficient to declare the case as free from infection. If virulent diphtheria bacilli have been present six consecutive negative reports at twice weekly intervals will be necessary. The importance of a virulence test in all suspected carriers is emphasized.

McCARTNEY, *Lancet*, Sept. 8, 1928.

